SERVICE MANUAL

S170
A/V SURROUND
SOUND
PREAMPLIFIER

NAD

S170

A/V SURROUND SOUND PREAMPLIFIER

PRODUCT SAFETY SERVICING GUIDELINES

CAUTION : DO NOT ATTEMPT TO MODIFY THIS PRODUCT IN ANY WAY. NEVER PERFORM CUSTOMIZED INSTALLATIONS WITHOUT MANUFACTURER'S APPROVAL. UNAUTHORIZED MODIFICATIONS WILL NOT ONLY VOID THE WARRANTY, BUT MAY LEAD TO YOUR BEING LIABLE FOR ANY RESULTING PROPERTY DAMAGE OR USER INJURY.

SERVICE WORK SHOULD BE PERFORMED ONLY AFTER YOU ARE THOROUGHLY FAMILIAR WITH ALL OF THE FOLLOWING SAFETY CHECKS AND SERVICING GUIDELINES. TO DO OTHERWISE, INCREASES THE RISK OF POTENTIAL HAZARDS AND INJURY TO THE USER.

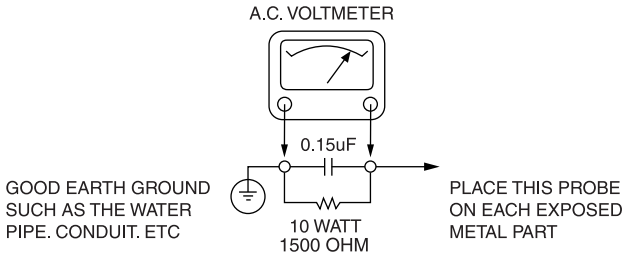
WHILE SERVICING, USE AN ISOLATION TRANSFORMER FOR PROTECTION FROM AC LINE SHOCK.

SAFETY CHECKS

AFTER THE ORIGINAL SERVICE PROBLEM HAS BEEN CORRECTED. A CHECK SHOULD BE MADE OF THE FOLLOWING.

SUBJECT : FIRE & SHOCK HAZARD

1. BE SURE THAT ALL COMPONENTS ARE POSITIONED IN SUCH A WAY AS TO AVOID POSSIBILITY OF ADJACENT COMPONENT SHORTS. THIS IS ESPECIALLY IMPORTANT ON THOSE MODULES WHICH ARE TRANSPORTED TO AND FROM THE REPAIR SHOP.
2. NEVER RELEASE A REPAIR UNLESS ALL PROTECTIVE DEVICES SUCH AS INSULATORS, BARRIERS, COVERS, SHIELDS, STRAIN RELIEFS, POWER SUPPLY CORDS, AND OTHER HARDWARE HAVE BEEN REINSTALLED PER ORIGINAL DESIGN. BE SURE THAT THE SAFETY PURPOSE OF THE POLARIZED LINE PLUG HAS NOT BEEN DEFEATED.
3. SOLDERING MUST BE INSPECTED TO DISCOVER POSSIBLE COLD SOLDER JOINTS, SOLDER SPLASHES OR SHARP SOLDER POINTS. BE CERTAIN TO REMOVE ALL LOOSE FOREIGN PARTICLES.
4. CHECK FOR PHYSICAL EVIDENCE OF DAMAGE OR DETERIORATION TO PARTS AND COMPONENTS. FOR FRAYED LEADS, DAMAGED INSULATION (INCLUDING AC CORD). AND REPLACE IF NECESSARY FOLLOW ORIGINAL LAYOUT, LEAD LENGTH AND DRESS.
5. NO LEAD OR COMPONENT SHOULD TOUCH A RECEIVING TUBE OR A RESISTOR RATED AT 1 WATT OR MORE. LEAD TENSION AROUND PROTRUDING METAL SURFACES MUST BE AVOIDED.
6. ALL CRITICAL COMPONENTS SUCH AS FUSES, FLAMEPROOF RESISTORS, CAPACITORS, ETC. MUST BE REPLACED WITH EXACT FACTORY TYPES, DO NOT USE REPLACEMENT COMPONENTS OTHER THAN THOSE SPECIFIED OR MAKE UNRECOMMENDED CIRCUIT MODIFICATIONS.
7. AFTER RE-ASSEMBLY OF THE SET ALWAYS PERFORM AN AC LEAKAGE TEST ON ALL EXPOSED METALLIC PARTS OF THE CABINET, (THE CHANNEL SELECTOR KNOB, ANTENNA TERMINALS. HANDLE AND SCREWS) TO BE SURE THE SET IS SAFET TO OPERATE WITHOUT DANGER OF ELECTRICAL SHOCK. DO NOT USE A LINE ISOLATION TRANSFORMER DURING THIS TEST USE AN AC VOLTMETER, HAVING 5000 OHMS PER VOLT OR MORE SENSITIVITY, IN THE FOLLOWING MANNER; CONNECT A 1500 OHM 10 WATT RESISTOR, PARALLELED BY A .15 MFD, 150V AC TYPE CAPACITOR BETWEEN A KNOWN GOOD EARTH GROUND (WATER PIPE, CONDUIT, ETC.) AND THE EXPOSED METALLIC PARTS, ONE AT A TIME.
   MEASURE THE AC VOLTAGE ACROSS THE COMBINATION OF 1500 OHM RESISTOR AND .15 MFD CAPACITOR.
   REVERSE THE AC PLUG AND REPEAT AC VOLTAGE MEASUREMENTS FOR EACH EXPOSED METALLIC PART.
   VOLTAGE MEASURE MUST NOT EXCEED 75 VOLTS R.M.S. THIS CORRESPONDS TO 0.5 MILLIAMP AC ANY VALUE EXCEEDING THIS LIMIT CONSTITUTES A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED IMMEDIATELY.


A.C. VOLTMETER
0.15uF
GOOD EARTH GROUND SUCH AS THE WATER PIPE. CONDUIT. ETC
10 WATT 1500 OHM
PLACE THIS PROBE ON EACH EXPOSED METAL PART

SUBJECT : GRAPHIC SYMBOLS

THE LIGHTNING FLASH WITH ARROWHEAD SYMBOL, WITHIN AN EQUILATERAL TRIANGLE, IS INTENDED TO ALERT THE USER TO THE PRESENCE OF UNINSULATED "DANGEROUS VOLTAGE" WITHIN THE PRODUCT'S ENCLOSURE THAT MAY BE OF SUFFICIENT MAGNITUDE TO CONSTITUTE A RISK OF ELECTRIC SHOCK.

THE EXCLAMATION POINT WITHIN AN EQUILATERAL TRIANGLE IS INTENDED TO ALERT THE USER TO THE PRESENCE OF IMPORTANT OPERATING AND MAINTENANCE (SERVICING) INSTRUCTIONS IN THE LITERATURE ACCOMPANYING THE APPLIANCE.

SUBJECT : TIPS ON PROPER INSTALLATION

1. NEVER INSTALL ANY PRODUCT IN A CLOSED-IN RECESS, CUBBYHOLE OR CLOSELY FITTING SHELF SPACE. OVER OR CLOSE TO HEAT DUCT, OR IN THE PATH OF HEATED AIR FLOW.
2. AVOID CONDITIONS OF HIGH HUMIDITY SUCH AS: OUTDOOR PATIO INSTALLATIONS WHERE DEW IS A FACTOR, NEAR STEAM RADIATORS WHERE STEAM LEAKAGE IS A FACTOR, ETC.
3. AVOID PLACEMENT WHERE DRAPERIES MAY OBSTRUCT REAR VENTING. THE CUSTOMER SHOULD ALSO AVOID THE USE OF DECORATIVE SCARVES OR OTHER COVERINGS WHICH MIGHT OBSTRUCT VENTILATION.
4. WALL AND SHELF MOUNTED INSTALLATIONS USING A COMMERCAL MOUNTING KIT MUST FOLLOW THE FACTORY APPROVED MOUNTING INSTRUCTIONS A PRODUCT MOUNTED TO A SHELF OR PLATFORM MUST RETAIN ITS ORIGINAL FEET (OR THE EQUIVALENT THICKNESS IN SPACERS) TO PROVIDE ADEQUATE AIR FLOW ACROSS THE BOTTOM, BOLTS OR SCREWS USED FOR FASTENERS MUST NOT TOUCH ANY PARTS OR WIRING. PERFORM LEAKAGE TEST ON CUSTOMIZED INSTALLATIONS.
5. CAUTION CUSTOMERS AGAINST THE MOUNTING OF A PRODUCT ON SLOPING SHELF OR A TILTED POSITION, UNLESS THE PRODUCT IS PROPERLY SECURED.
6. A PRODUCT ON A ROLL-ABOUT CART SHOULD BE STABLE ON ITS MOUNTING TO THE CART. CAUTION THE CUSTOMER ON THE HAZARDS OF TRYING TO ROLL A CART WITH SMALL CASTERS ACROSS THRESHOLDS OR DEEP PILE CARPETS.
7. CAUTION CUSTOMERS AGAINST THE USE OF A CART OR STAND WHICH HAS NOT BEEN LISTED BY UNDERWRITERS LABORATORIES, INC. FOR USE WITH THEIR SPECIFIC MODEL OF TELEVISION RECEIVER OR GENERICALLY APPROVED FOR USE WITH T.V.'S OF THE SAME OR LARGER SCREEN SIZE.
8. CAUTION CUSTOMERS AGAINST THE USE OF EXTENSION CORDS, EXPLAIN THAT A FOREST OF EXTENSIONS SPROUTING FROM A SINGLE OUTLET CAN LEAD TO DISASTROUS CONSEQUENCES TO HOME AND FAMILY.

SERVICING PRECAUTIONS

CAUTION : Before servicing the A/V Receiver covered by this service data and its supplements and addends, read and follow the *SAFETY PRECAUTIONS. NOTE* : if unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions in this publication, always follow the safety precautions.
Remember Safety First:

General Servicing Precautions

1. Always unplug the A/V Receiver AC power cord from the AC power source before:
   (1) Removing or reinstalling any component, circuit board, module, or any other assembly.
   (2) Disconnecting or reconnecting any internal electrical plug or other electrical connection.
   (3) Connecting a test substitute in parallel with an electrolytic capacitor.
   Caution : A wrong part substitution or incorrect polarity installation of electrolytic capacitors may result in an explosion hazard.

2. Do not spray chemicals on or near this A/V Receiver or any of its assemblies.

3. Unless specified otherwise in this service data, clean electrical contacts by applying an appropriate contact cleaning solution to the contacts with a pipe cleaner, cottontipped swab, or comparable soft applicator.
   Unless specified otherwise in this service data, lubrication of contacts is not required.

4. Do not defeat any plug/socket B+ voltage interlocks with which instruments covered by this service manual might be equipped.

5. Do not apply AC power to this A/V Receiver and/or any of its electrical assemblies unless all solid-state device heat sinks are correctly installed.

6. Always connect test instrument ground lead to the appropriate ground before connecting the test instrument positive lead. Always remove the test instrument ground lead last.

Insulation Checking Procedure

Disconnect the attachment plug from the AC outlet and turn the power on. Connect an insulation resistance meter(500V) to the blades of the attachment plug. The insulation resistance between each blade of the attachment plug and accessible conductive parts (Note 1) should be more than 1M-ohm.
Note 1 : Accessible Conductive Parts including Metal panels, Input terminals, Earphone jacks, etc.

Electrostatically Sensitive (ES) Devices

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical Es devices are integrated circuits and some field effect transistors and semiconductor chip components.
The following techniques should be used to help reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed for potential shock reasons prior to applying power to the unit under test.

2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.

3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.

4. Use only an antistatic solder removal device. Some solder removal devices not classified a “anti-static” can generate electrical charges sufficient to damage ES devices.

5. Do not use freonpropelled chemicals. These can generate electrical charge sufficient to damage ES devices.

6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil, or comparable conductive material).

7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

   Caution : Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

8. Minimize bodily motions when handing unpackaged replacement ES devices. (Normally harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device.)

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SERVICE SAFETY PRECAUTIONS

1. Replacing the Fuses

CAUTION: FOR CONTINUED PROTECTION AGAINST THE RISK OF FIRE REPLACE ONLY WITH SAME TYPE OF FUSE.

REFERENCE NO.	PART NUMBER	DESCRIPTION
FUSE1*C ⚠	5120-0050-0	1.6A 250V Time Lag
FUSE2*C ⚠	5100-1020-1B	1A 250V Time Lag
FUSE3*C ⚠	5120-0065-0	2A 250V Time Lag

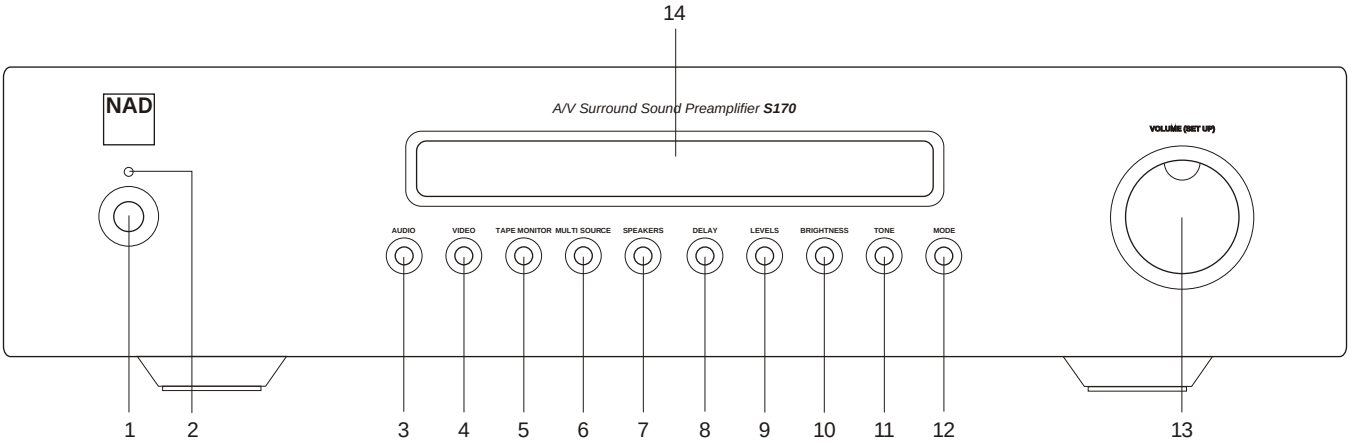
NOTE:
*C : European version only

2. Safety-check out

Before returning the product to the customer, make leakage current or resistance measurements to determine that exposed parts are acceptably insulated from the supply circuit.

Parts marked with the symbol ⚠ are critical with regard to the risk of fire and electric shock. Replace only with parts recommended by the manufacturer.

FRONT PANEL CONTROLS

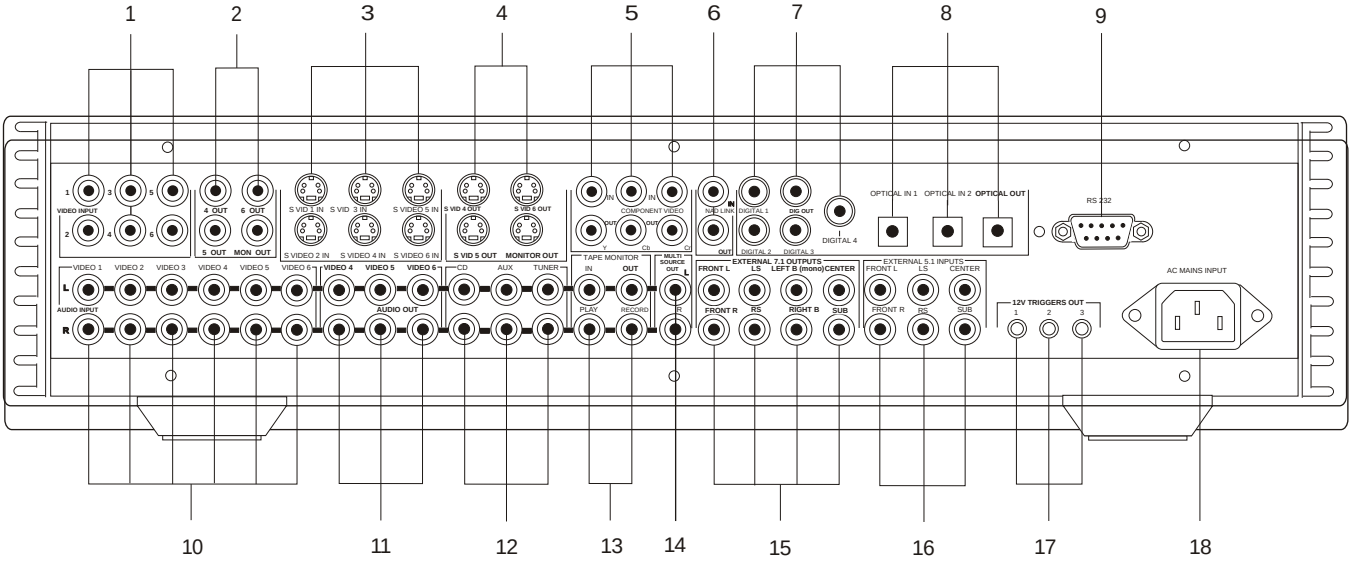


1. POWER SWITCH
2. POWER INDICATOR
3. AUDIO INPUT SELECTOR
4. VIDEO INPUT SELECTOR
5. TAPE MONITOR
6. MULTI SOURCE
7. SPEAKERS
8. DELAY
9. LEVELS
10. BRIGHTNESS
11. TONE
12. MODE
13. VOLUME/SETUP CONTROL
14. DISPLAY

The graphic symbol of a lightning flash with an arrow point within a triangle signifies that there is dangerous voltage within the unit and it posses a hazard to anyone removing the cover to gain access to the interior of the unit. **Only qualified service personnel should make such attempt.**

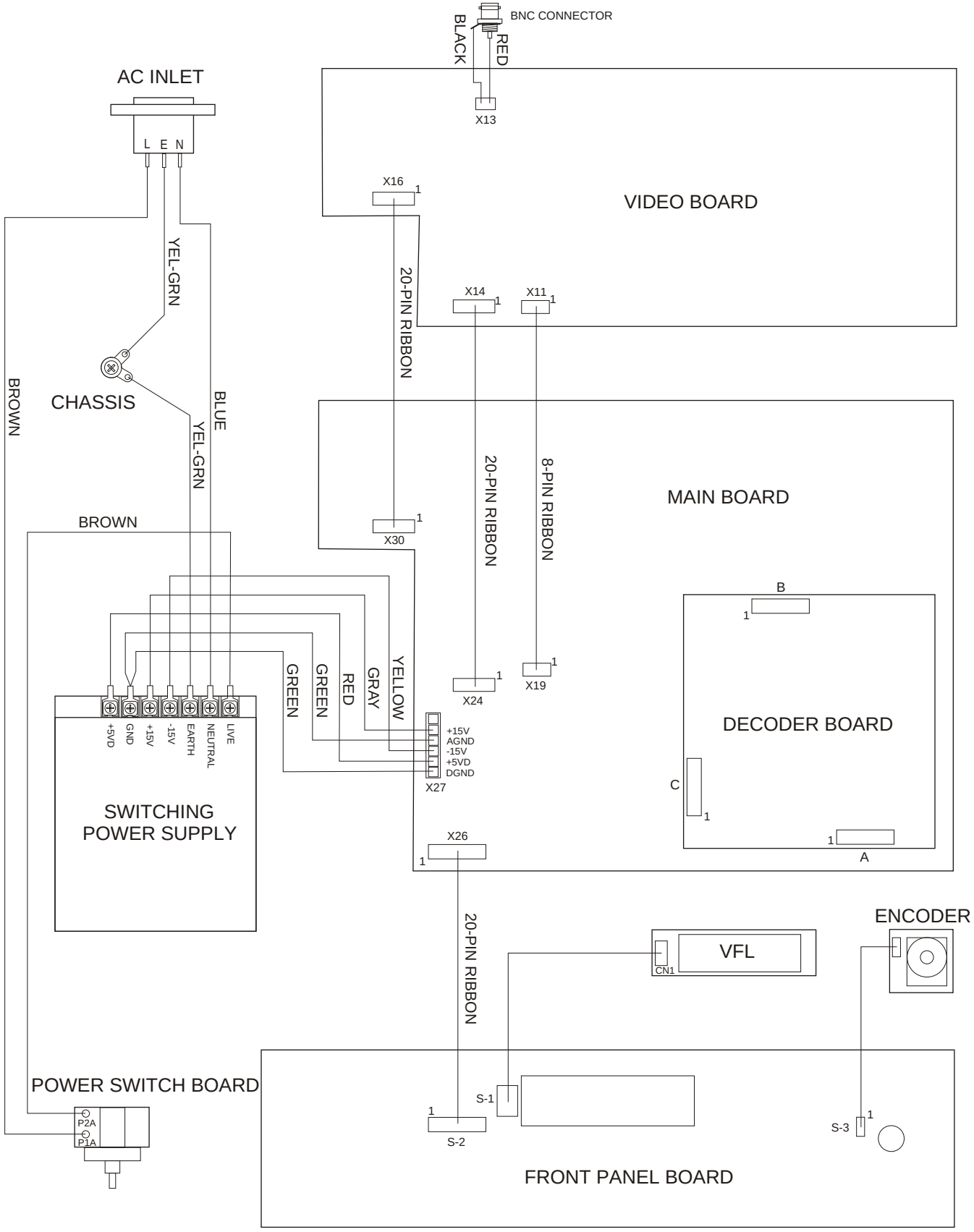
The graphic symbol of an exclamation point within an equilateral triangle warns a user of the device that it is necessary to refer to the instruction manual and its warnings for proper operation of the unit.

REAR PANEL CONNECTIONS



1. VIDEO INPUTS
2. VIDEO OUTPUTS
3. S-VIDEO INPUTS
4. S-VIDEO OUTPUTS
5. COMPONENT VIDEO INPUTS/OUTPUTS
6. NAD LINK INPUT/OUTPUT
7. COAXIAL DIGITAL INPUTS/OUTPUT
8. OPTICAL DIGITAL INPUTS/OUTPUT
9. RS-232
10. AUDIO INPUTS
11. AUDIO OUTPUTS
12. CD/AUX/TUNER INPUTS
13. TAPE INPUT/OUTPUT
14. MULTI SOURCE OUTPUT
15. EXT. 7.1 OUTPUTS
16. EXT. 5.1 INPUTS
17. 12V TRIGGET OUTPUTS
18. AC INLET

WIRING DIAGRAM



SPECIFICATIONS

STANDARD SETTINGS

1. Volume = 0dB
2. Tone Controls = 0dB
3. LFE Channel = 0dB
4. Bass Limiter = Off
5. Channel Levels = 0dB
6. Delays = 0 meters/ft
7. Speakers = Large
8. Subwoofer = Yes

SURROUND BACK LEFT & RIGHT

1. Dolby 1.0 test disc (5.1 input)
2. Choose titles with SL and SR signals
3. Put unit to 6.1 mode setting

DOLBY DIGITAL MODE: Dolby test disc 1.0

1. Output level	All 7	Title 30	997Hz	0.22 ± 0.03 V
2. Channel Difference	All 5	Tilte 30	997Hz	0 ± 0.5 dB
3. Frequency Response	L	Title 43	200Hz-20kHz	0 ± 0.2 dB
Title 30 for reference. For Sub,	R	Title 45	200Hz-20kHz	0 ± 0.2 dB
reference is start of title 48	C	Title 44	200Hz-20kHz	0 ± 0.2 dB
	SL	Title 46	200Hz-20kHz	0 ± 0.2 dB
	SR	Title 47	200Hz-20kHz	0 ± 0.2 dB
	Sub	Title 48	20Hz-80Hz	0 ± 0.2 dB
4. THD	L	Title 65	997Hz	≤0.01%
With audio BPF	R	Title 67	997Hz	≤0.01%
	C	Title 66	997Hz	≤0.01%
	SL	Title 68	997Hz	≤0.01%
	SR	Title 69	997Hz	≤0.01%
	Sub	Title 70	30Hz	≤0.03%
5. S/N Ratio, A-wtd	All 5	Title 63		≥65dB
20kHz LPF				
6. Channel Separation	All 5	Title 65-69	997Hz	≥65dB
20kHz LPF				

DTS MODE: DTS Consumer Product Evaluation Test Disc

1. Output level	All 5	Track 21	1kHz	0.22 ± 0.03 V
For Sub, ref. L out at track 10	Sub	Track 15	30Hz	+9.4 ± 1 dB
2. Channel Difference	All 5	Track 21	1kHz	0 ± 0.5 dB
3. Frequency Response	L	Track 26	20Hz-20kHz	0 ± 0.2 dB
Track 21 for reference	R	Track 27	20Hz-20kHz	0 ± 0.2 dB
	C	Track 30	20Hz-20kHz	0 ± 0.5 dB
	SL	Track 28	20Hz-20kHz	0 ± 0.5 dB
	SR	Track 29	20Hz-20kHz	0 ± 0.5 dB
4. THD	L	Track 10	1kHz	≤0.01%

With audio BPF	R	Track 11	1kHz	≤0.01%
	C	Track 14	1kHz	≤0.01%
	SL	Track 12	1kHz	≤0.01%
	SR	Track 13	1kHz	≤0.01%

DOLBY PROLOGIC MODE: Analog input signal = 2V

1. THD	L	L	1kHz	≤0.05%
With 80kHz LPF	R	R	1kHz	≤0.05%
	C	L = R	1kHz	≤0.05%
	SL	L = -R	1kHz	≤0.05%
	SR	L = -R	1kHz	≤0.05%
2. S/N Ratio A-	L	L	1kHz	≥85dB
wtd	R	R	1kHz	≥85dB
	C	L = R	1kHz	≥85dB
	SL	L = -R	1kHz	≥85dB
	SR	L = -R	1kHz	≥85dB
3. Frequency Response	L	L	40Hz	0 ± 0.2 dB
1kHz reference			20kHz	0 ± 0.4 dB
	R	R	40Hz	0 ± 0.2 dB
			20kHz	0 ± 0.4 dB
	C	L = R	300Hz	0 ± 0.2 dB
			20kHz	0 ± 0.4 dB
	SL/SR	L = -R	30Hz	0 ± 0.4 dB
			6.5kHz	-3 ± 1 dB

POWER AMPLIFIER: External 5.1 input = 2V

1. Output level	All 5	1kHz	2.2 ± 0.3 V
2. THD, with 30kHz LPF	All 5	1kHz	≤0.01%
3. S/N Ratio, A-wtd	All 5		≥90dB
4. Frequency response	All 5	20Hz-20kHz	0 ± 0.2 dB

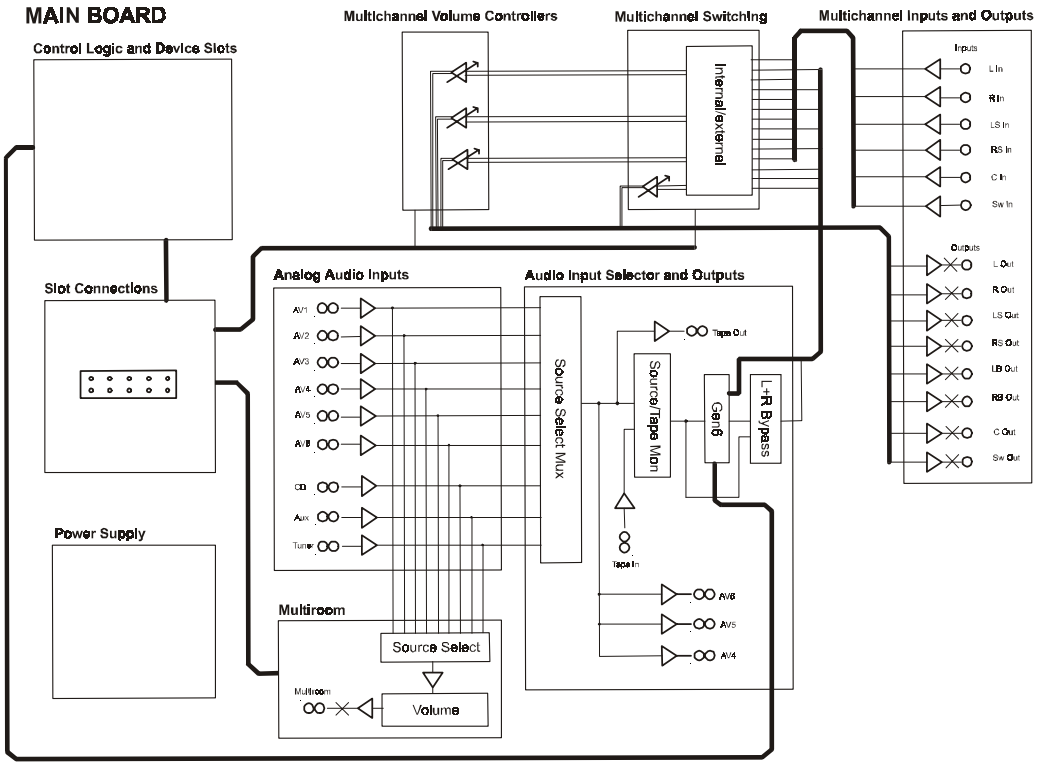
PHYSICAL SPECIFICATIONS:

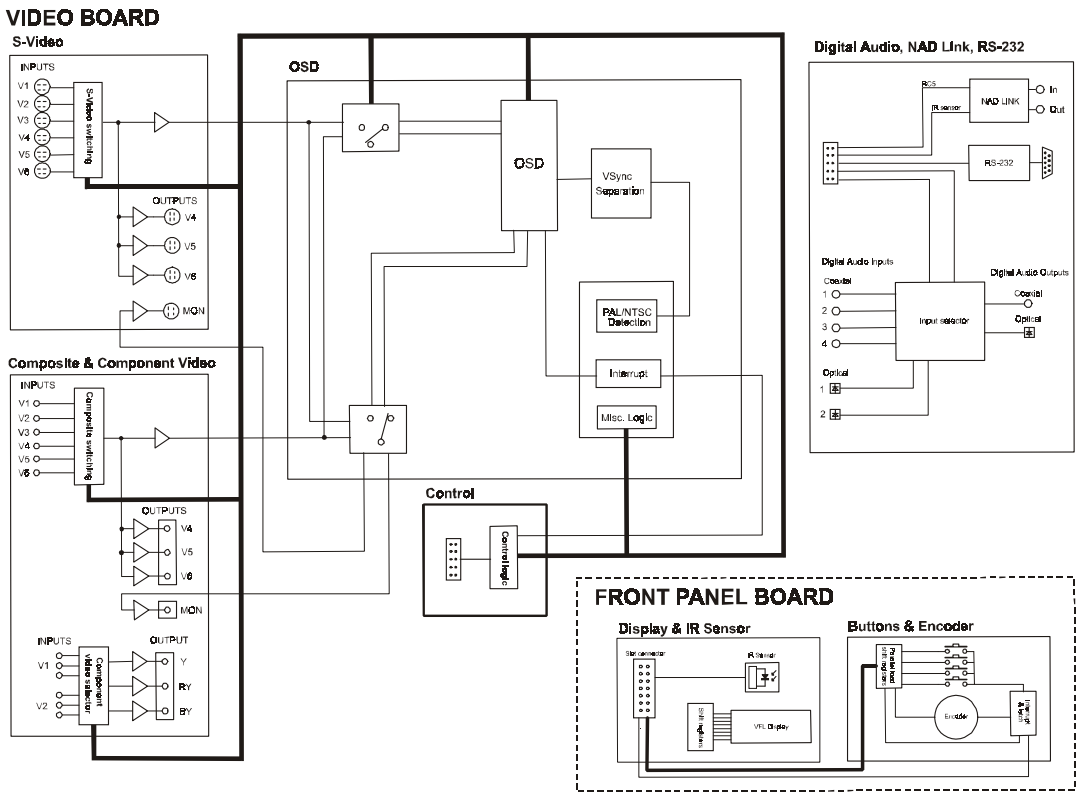
Size (W x H x D) 17 3/4 x 3 7/8 x 11 1/4"
(450 x 97 x 285 mm)

Net weight 11 lbs (4.99kg)

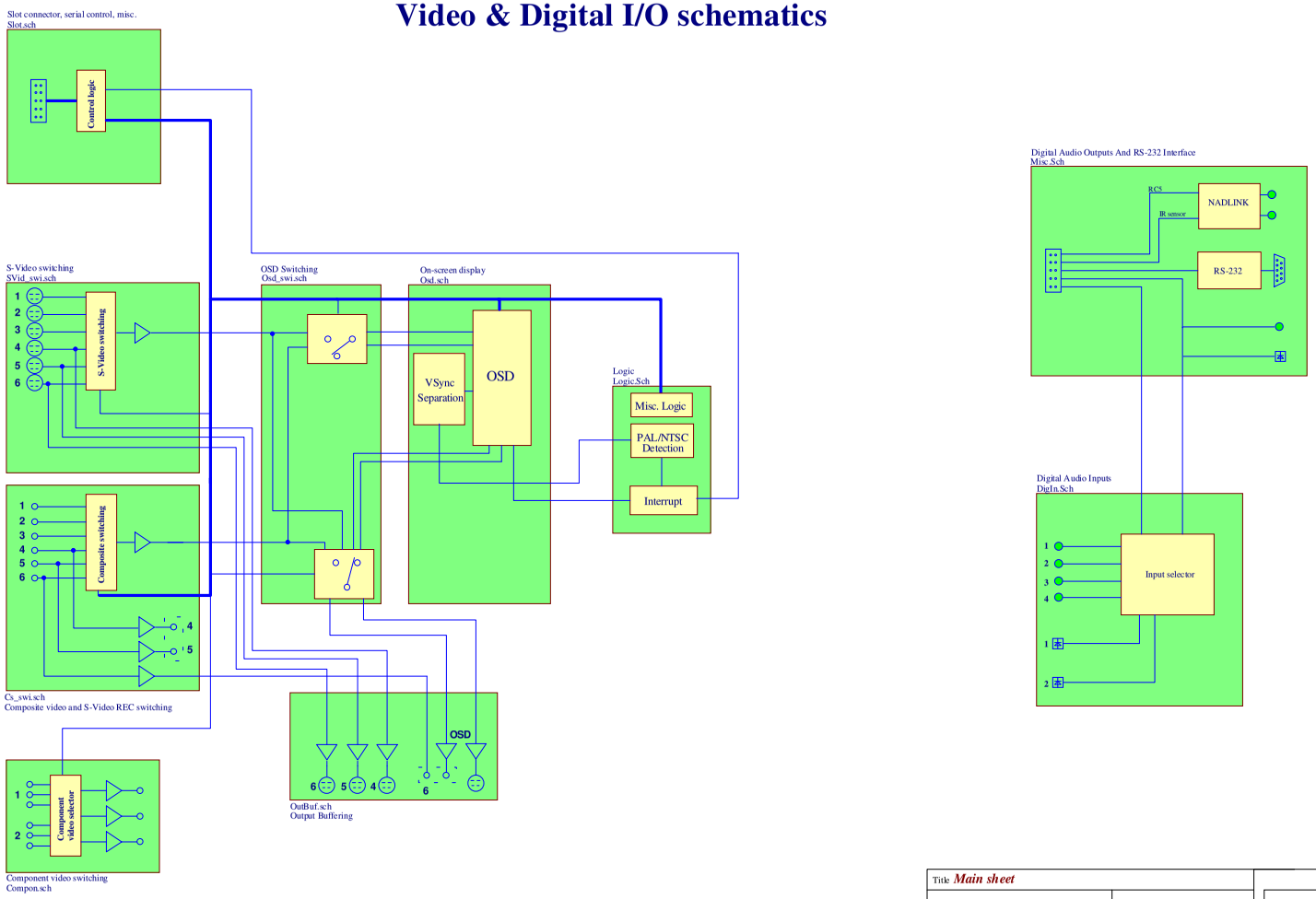
Shipping weight 13 lbs (5.89kg)

BLOCK DIAGRAM





Video & Digital I/O schematics



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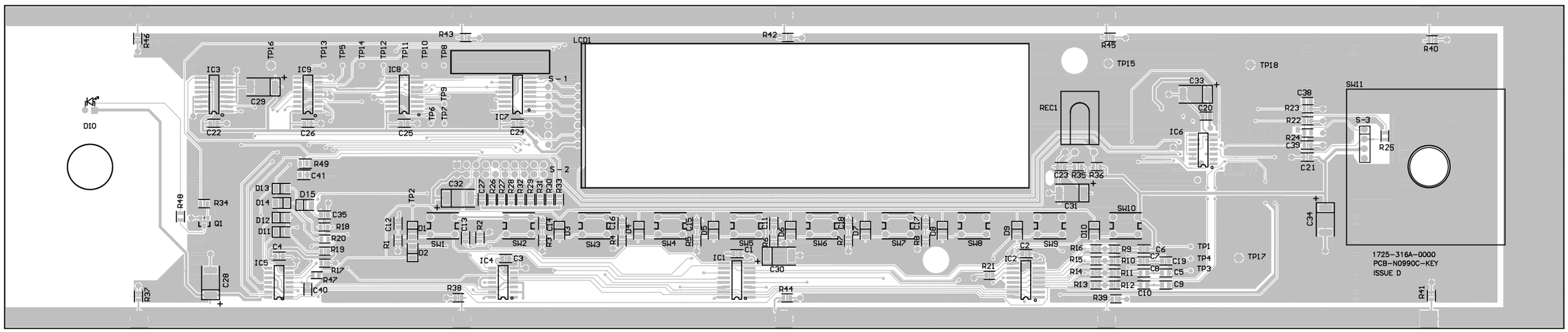
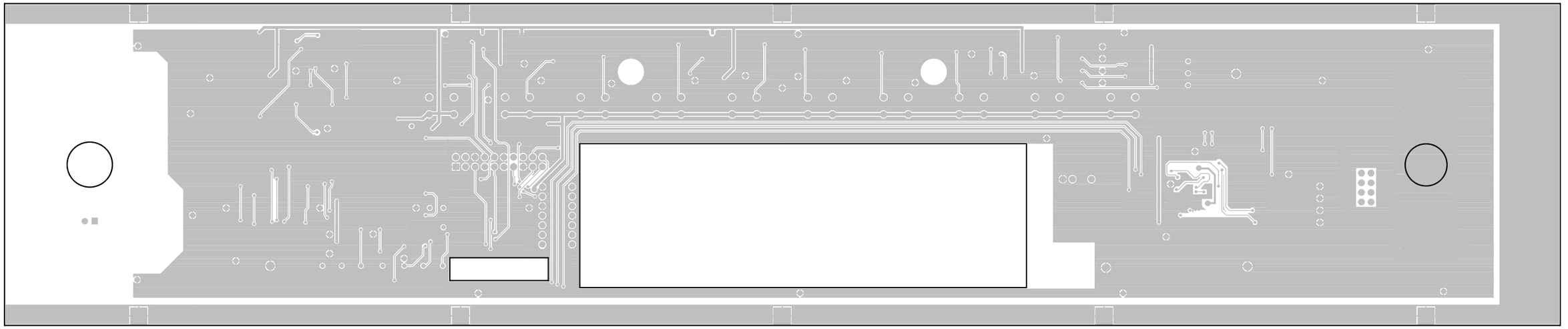
Author: Jouni Myllymäki	*Flextronics Design Finland* *Finlaysoninkatu 2* *33210 Tampere* *FINLAND* *Tel. +358 205 345 700*	
Project: NAD S170		
Revision: 2.2b	Size: A3	
Date: 17-May-2002 Time: 13:16:11	Sheet 1 of 11	
File:		

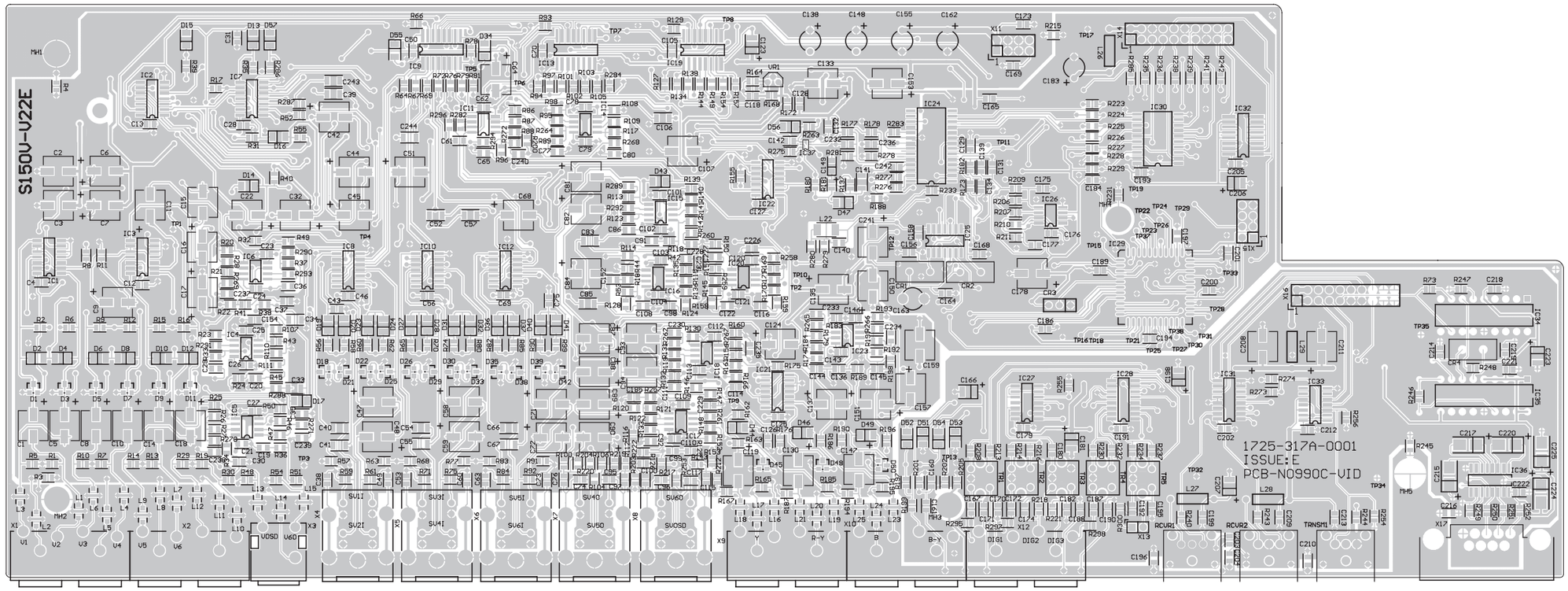
KEY BOARD - COMPONENT SIDE



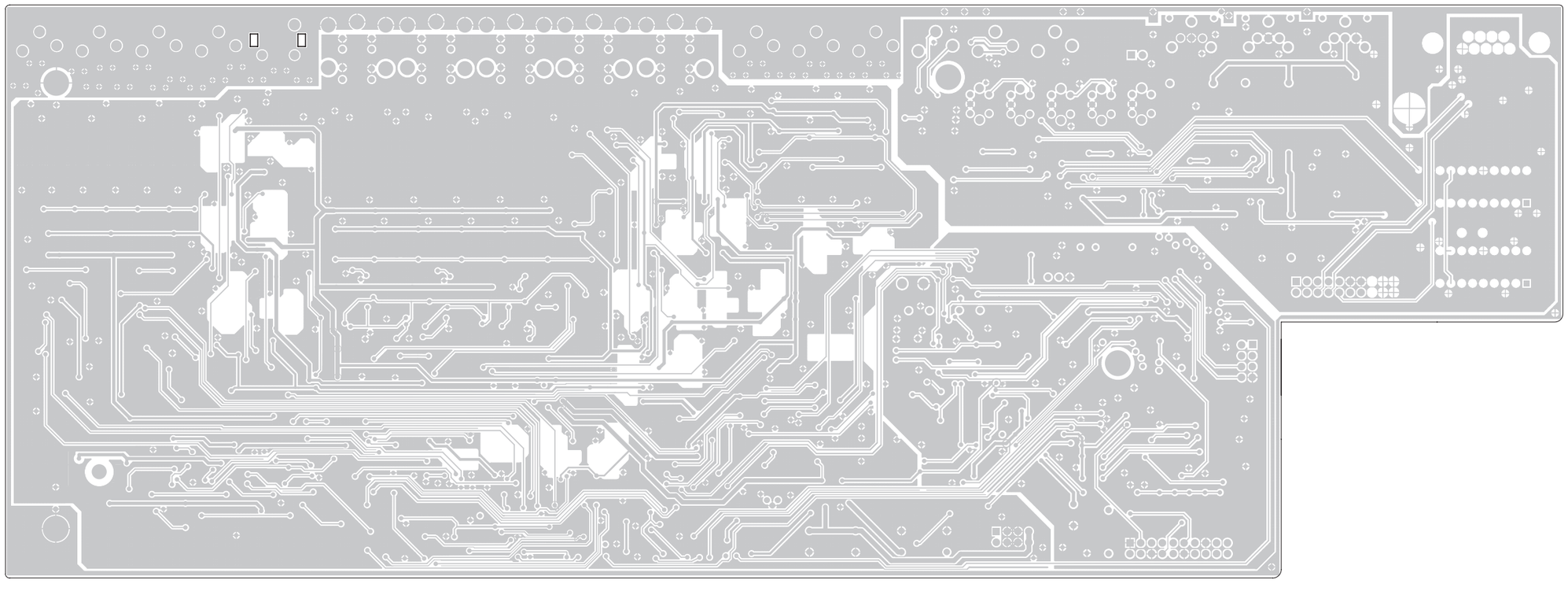
KEY BOARD - SOLDER SIDE



VIDEO BOARD - COMPONENT SIDE

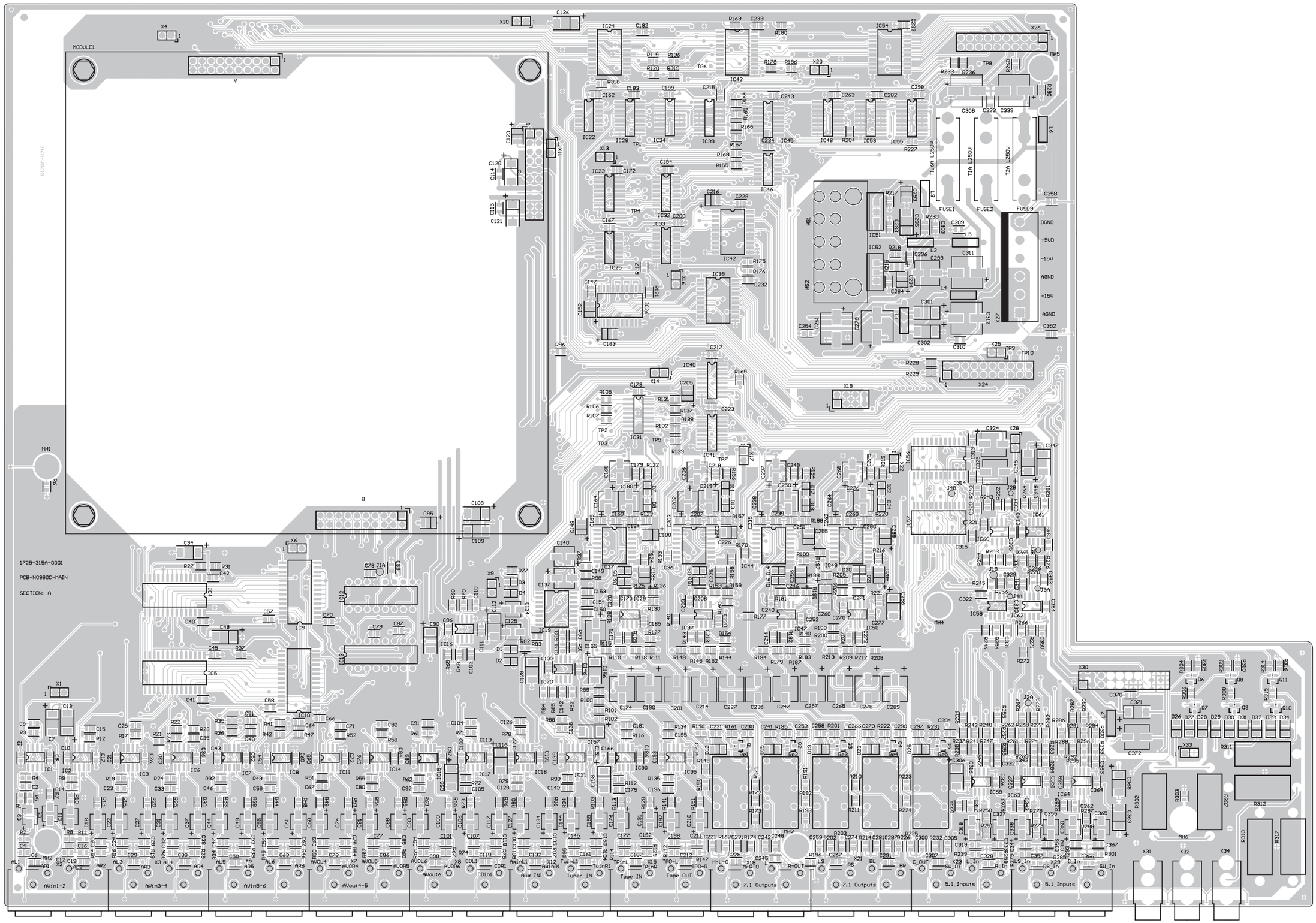


VIDEO BOARD - SOLDER SIDE

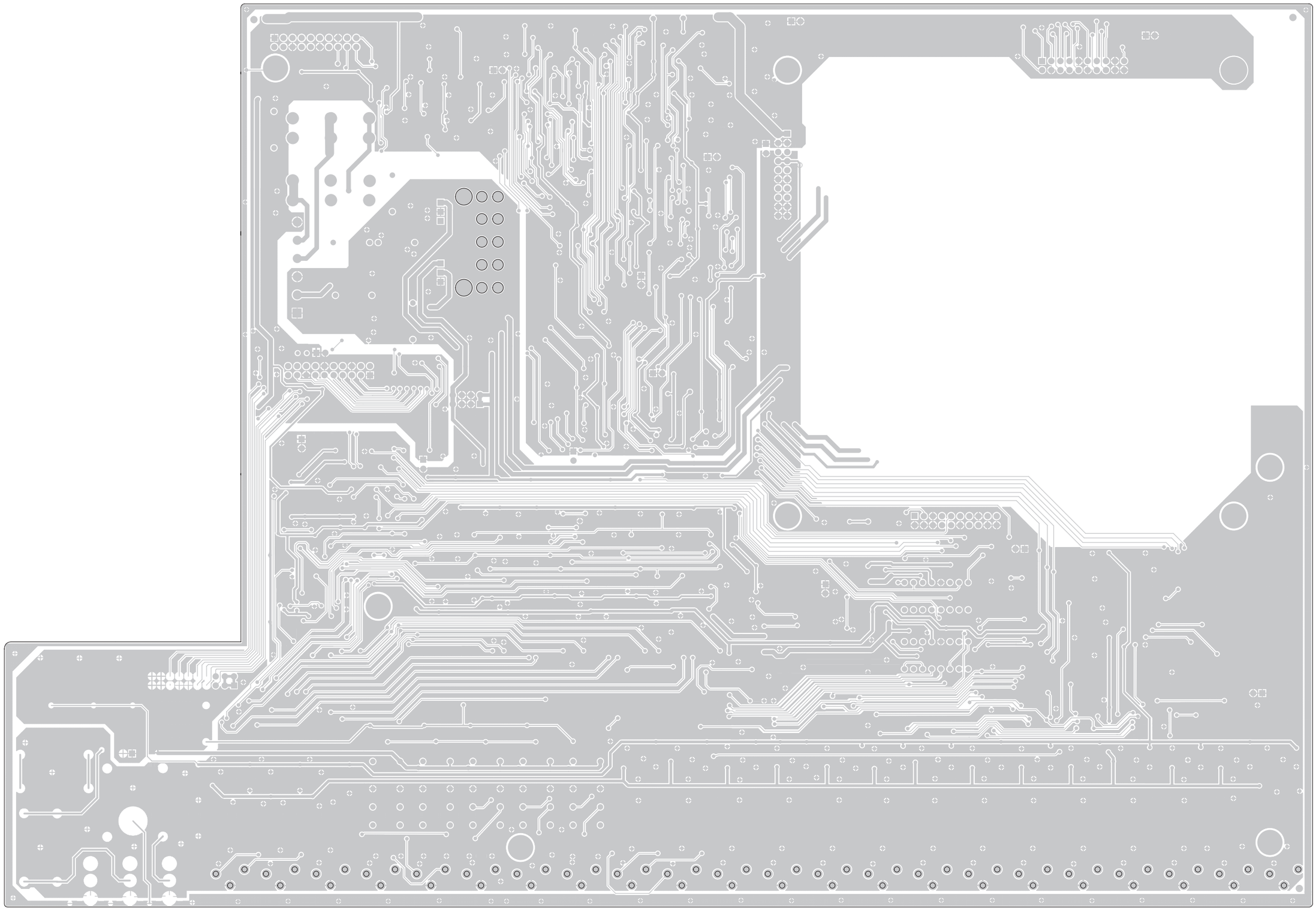


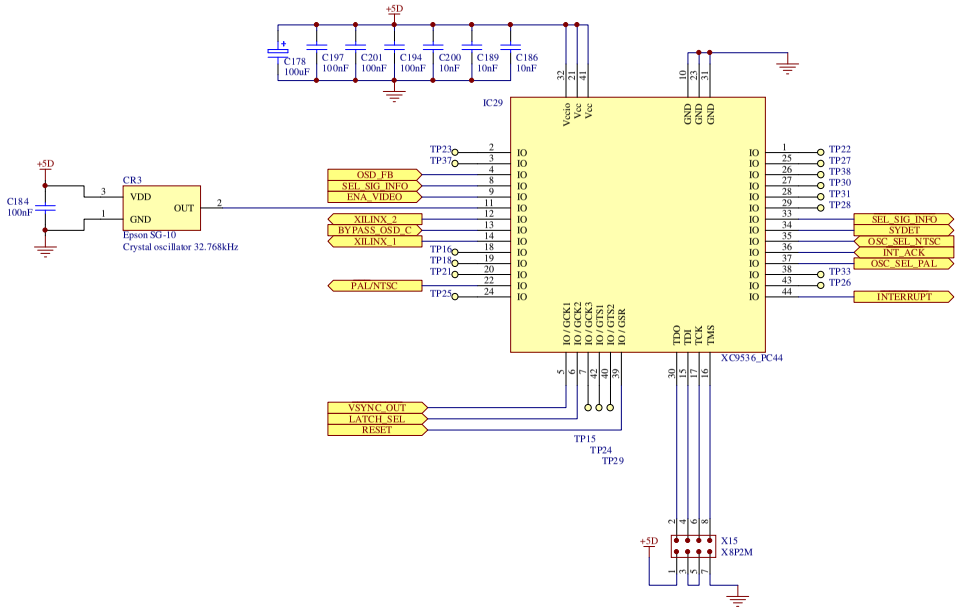
PCB LAYOUT

MAIN BOARD - COMPONENT SIDE



MAIN BOARD - SOLDER SIDE





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Revision:	2.2b
Size:	A3
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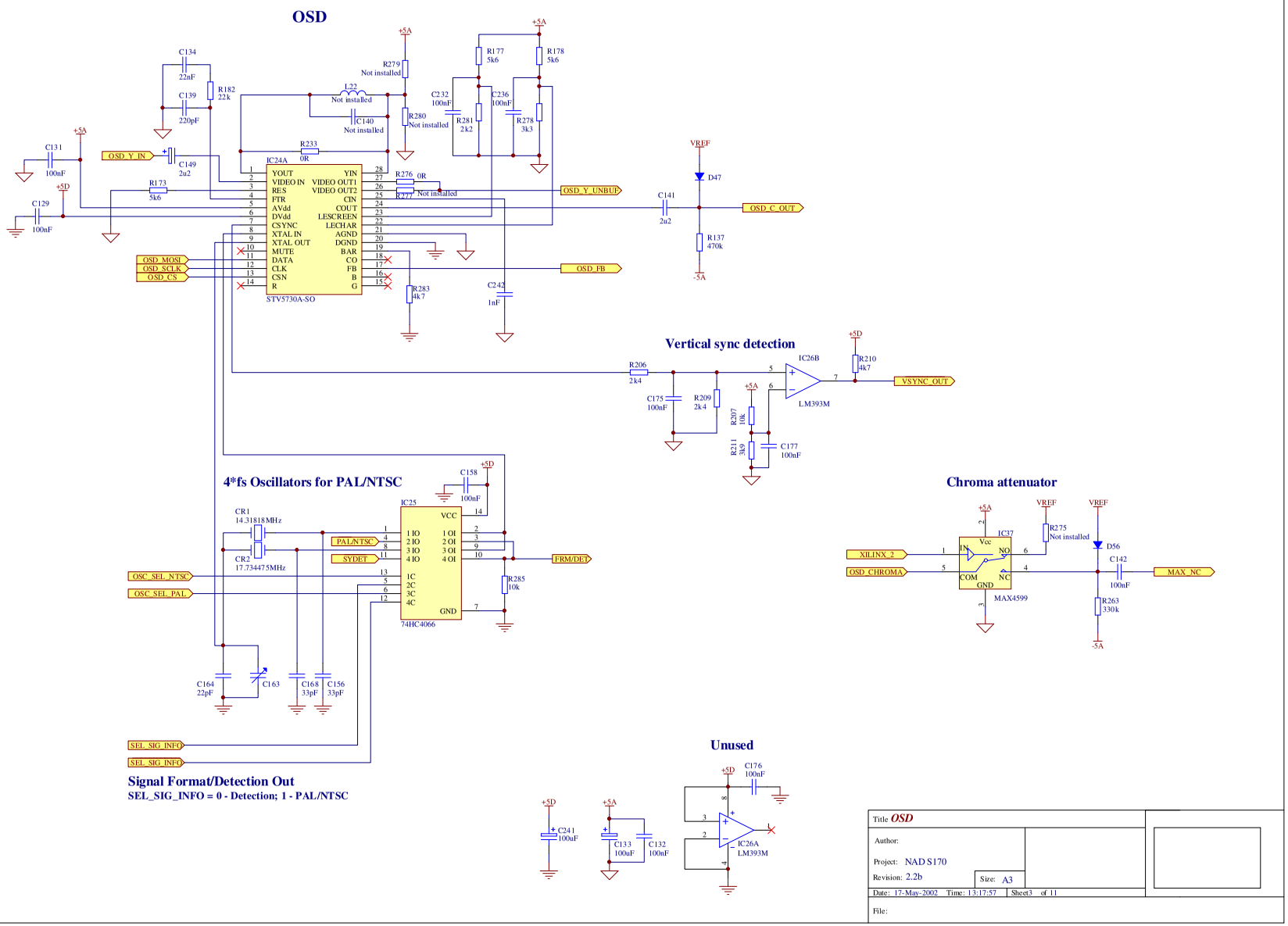
OSD
Vertical sync detection
4*fs Oscillators for PAL/NTSC
Chroma attenuator
Unused
Signal Format/Detection Out
SEL_SIG_INFO = 0 - Detection; 1 - PAL/NTSC
STV5730A-SO
74HC4066
LM393M
MAX4599
OSD_Y_IN
OSD_MOSI
OSD_SCLK
OSD_CS
OSD_Y_UNBUF
OSD_FB
OSD_C_OUT
VSYNC_OUT
FRM/DET
PAL/NTSC
SYDET
OSC_SEL_NTSC
OSC_SEL_PAL
SEL_SIG_INFO
XILINX_2
OSD_CHROMA
MAX_NC
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Author:
Project: NAD S170
Revision: 2.2b
Size: A3
Date: 17-May-2002 Time: 13:17:57 Sheet3 of 11
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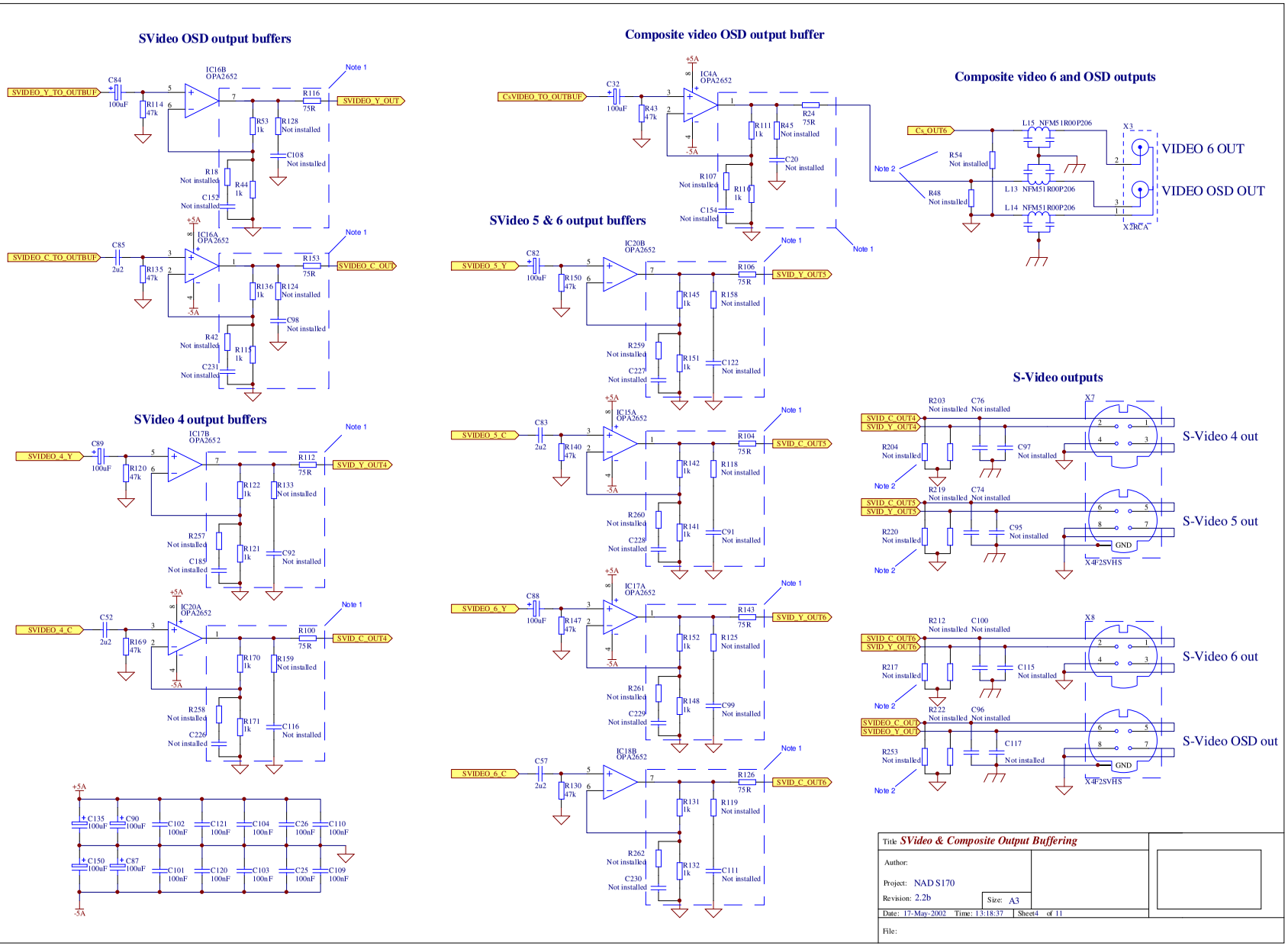
SVideo OSD output buffers
IC16B OPA2652
SVIDEO_Y_TO_OUTBUF
C84 100uF
R114 47k
R53 1k
R128 Not installed
R116 75R
SVIDEO_Y_OUT
C108 Not installed
R18 Not installed
R44 1k
C152 Not installed
Note 1
+5A
IC16A OPA2652
SVIDEO_C_TO_OUTBUF
C85 2u2
R135 47k
R136 1k
R124 Not installed
R153 75R
SVIDEO_C_OUT
C98 Not installed
R42 Not installed
R115 1k
C231 Not installed
-5A
SVideo 4 output buffers
IC17B OPA2652
SVIDEO_4_Y
C89 100uF
R120 47k
R122 1k
R133 Not installed
R112 75R
SVID_Y_OUT4
R257 Not installed
R121 1k
C185 Not installed
C92 Not installed
IC20A OPA2652
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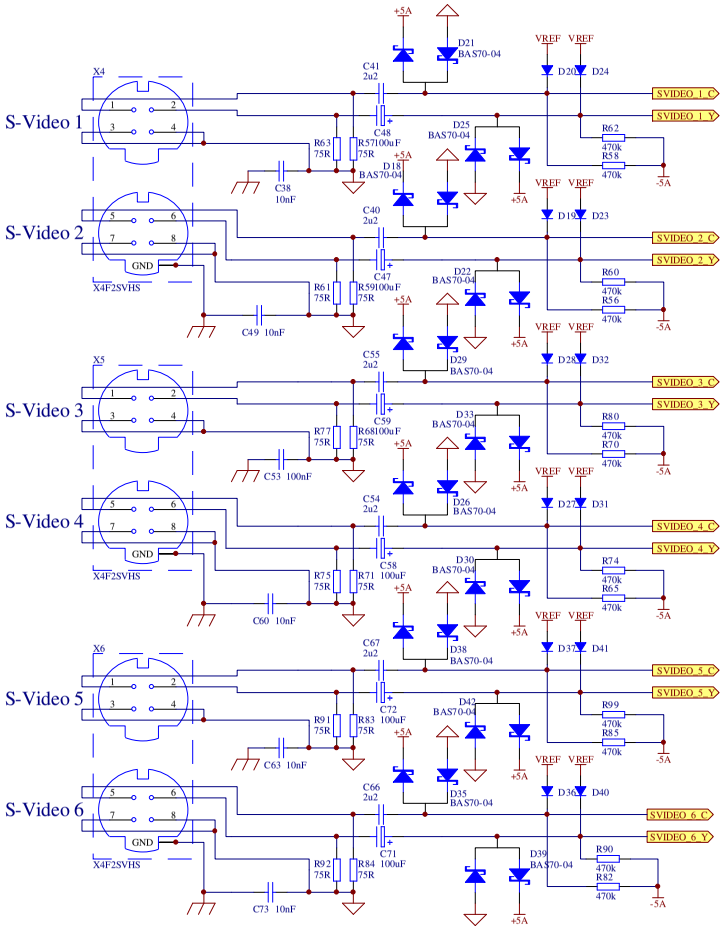
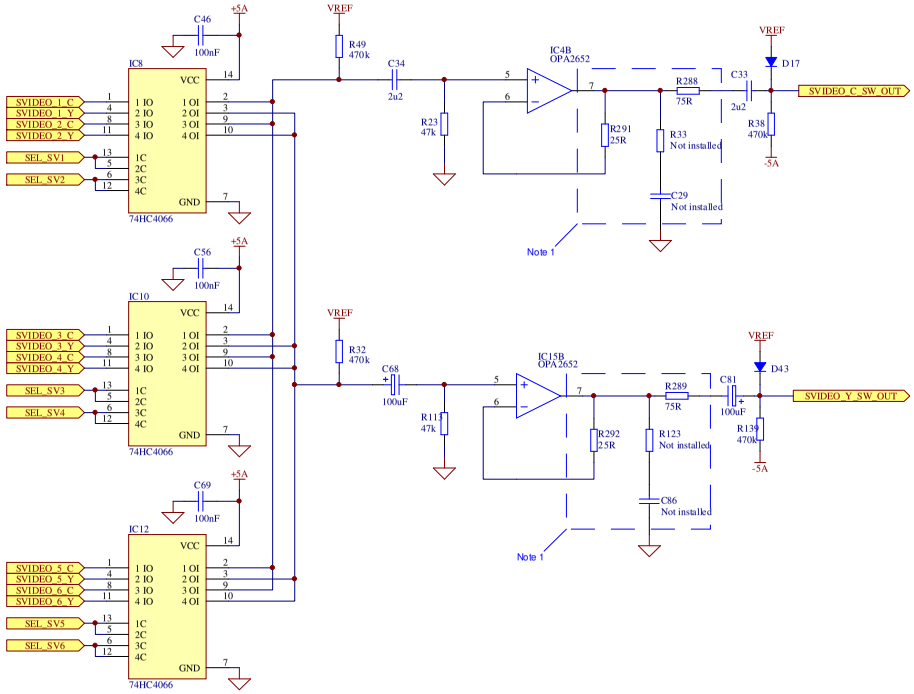
C52 2u2
R169 47k
R170 1k
R159 Not installed
R100 75R
SVID_C_OUT4
R258 Not installed
R171 1k
C226 Not installed
C116 Not installed
C135 100uF
C90 100uF
C102 100nF
C121 100nF
C104 100nF
C26 100nF
C110 100nF
C150 100uF
C87 100uF
C101 100nF
C120 100nF
C103 100nF
C25 100nF
C109 100nF
Composite video OSD output buffer
IC4A OPA2652
CsVIDEO_TO_OUTBUF
C32 100uF
R43 47k
R111 1k
R45 Not installed
R24 75R
C20 Not installed
R107 Not installed
R110 1k
C154 Not installed
SVideo 5 & 6 output buffers
IC20B OPA2652
SVIDEO_5_Y
C82 100uF
R150 47k
R145 1k
R158 Not installed
R106 75R
SVID_Y_OUT5
R259 Not installed
R151 1k
C227 Not installed
C122 Not installed
IC15A OPA2652
SVIDEO_5_C
C83 2u2
R140 47k
R142 1k
R118 Not installed
R104 75R
SVID_C_OUT5
R260 Not installed
R141 1k
C228 Not installed
C91 Not installed
IC17A OPA2652
SVIDEO_6_Y
C88 100uF
R147 47k
R152 1k
R125 Not installed
R143 75R
SVID_Y_OUT6
R261 Not installed
R148 1k
C229 Not installed
C99 Not installed
IC18B OPA2652
SVIDEO_6_C
C57 2u2
R130 47k
R131 1k
R119 Not installed
R126 75R
SVID_C_OUT6
R262 Not installed
R132 1k
C230 Not installed
C111 Not installed
Composite video 6 and OSD outputs
Cs_OUT6
L15 NFM51R00P206
L13 NFM51R00P206
L14 NFM51R00P206
X3
X2RCA
R54 Not installed
R48 Not installed
VIDEO 6 OUT
VIDEO OSD OUT
S-Video outputs
X7
X8
X4F2SVHS
R203 Not installed
C76 Not installed
R204 Not installed
C97 Not installed
R219 Not installed
C74 Not installed
R220 Not installed
C95 Not installed
R212 Not installed
C100 Not installed
R217 Not installed
C115 Not installed
R222 Not installed
C96 Not installed
R253 Not installed
C117 Not installed
GND
S-Video 4 out
S-Video 5 out
S-Video 6 out
S-Video OSD out
Note 2
Title SVideo & Composite Output Buffering
Author:
Project: NAD S170
Revision: 2.2b
Size: A3
Date: 17-May-2002 Time: 13:18:37 Sheet4 of 11
File:

S-Video inputs

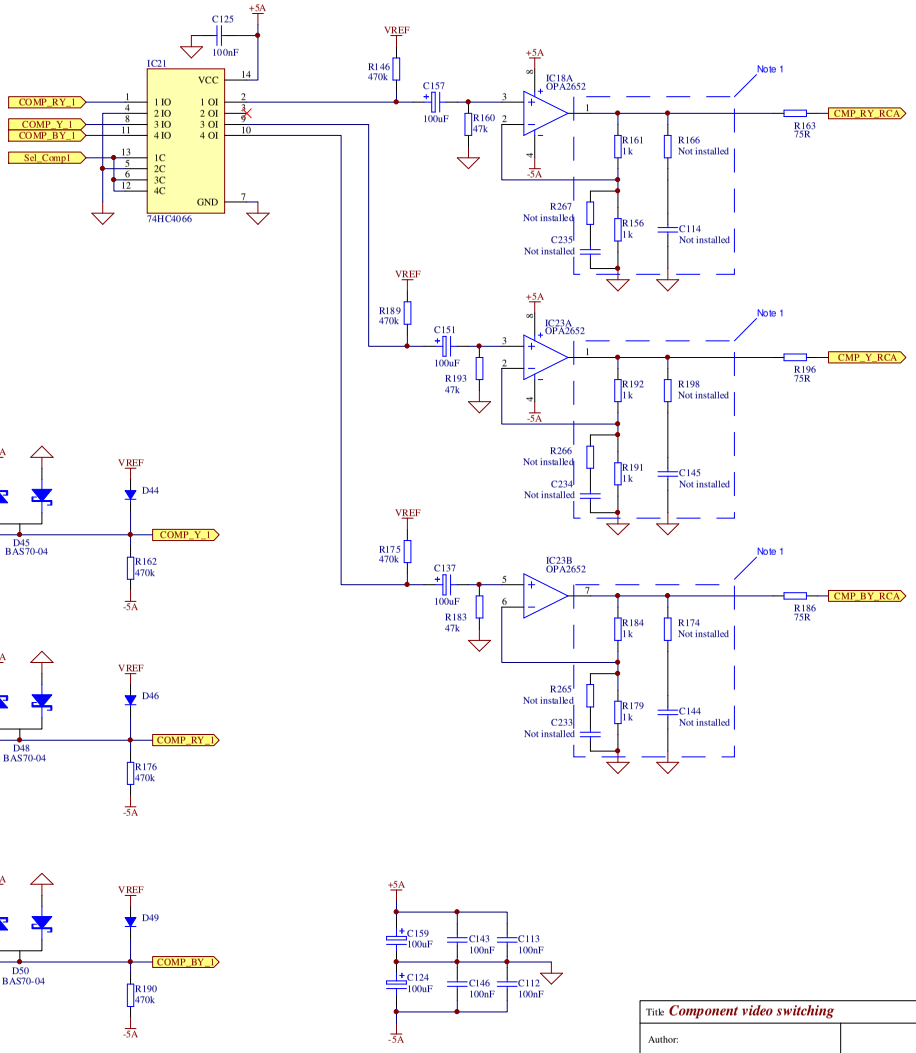


S-Video selector & buffers

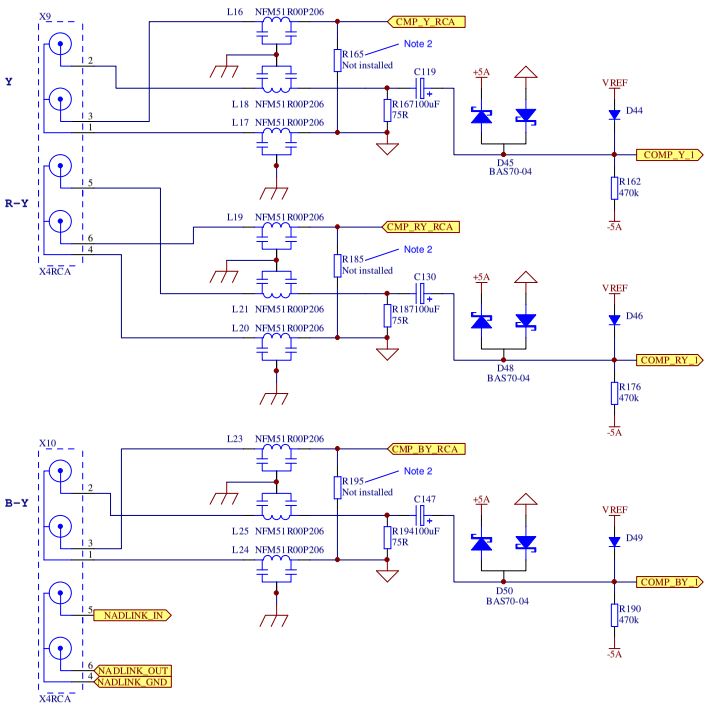


Title	*S-Video switching*
Author:	
Project:	NAD S170
Revision:	2.2b
Size:	A3
Date:	17-May-2002 Time: 13:19:11 Sheet5 of 11
File:	

Component video selector & buffers

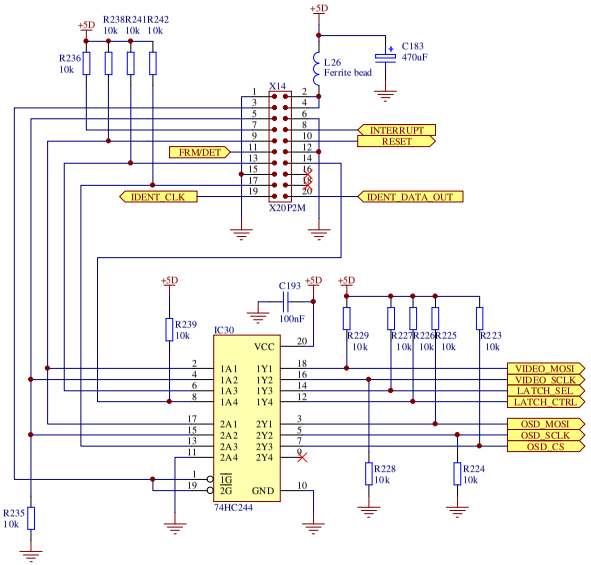


Component video inputs & outputs



Title	*Component video switching*
Author:	
Project:	NAD S170
Revision:	2.2b
Size:	A3
Date:	17-May-2002 Time: 13:20:07 Sheet6 of 11
File:	

Slot connector & Control bus buffering

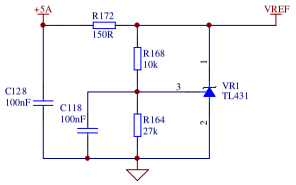


Notes

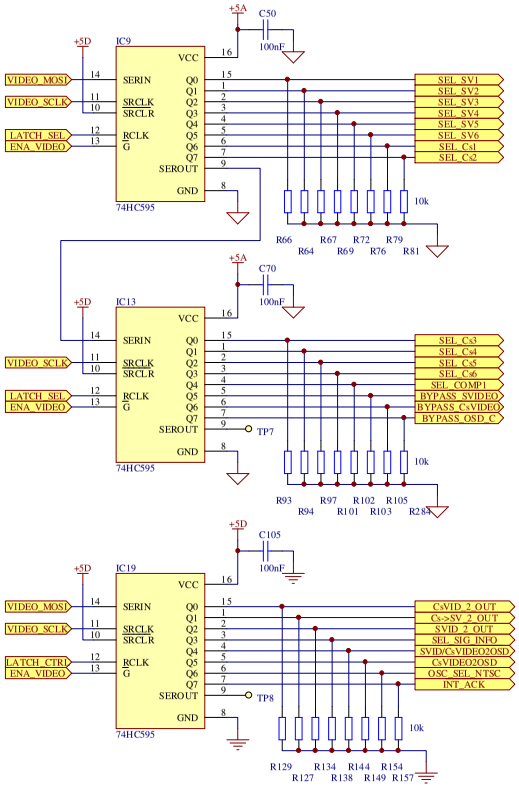
Note 1: No PCB groundplane inside this component area

Note 2: Should be at least 100k if installed

3.4 V reference voltage

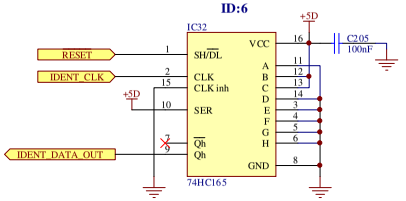


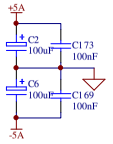
Source selector, REC selector & OSD control signals

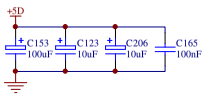


Slot Identification circuit

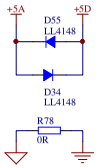
ID:6



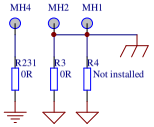




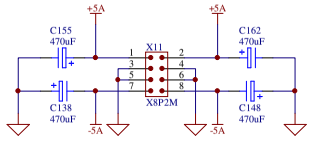
Ground connection should be placed on PCB as close to IC25, IC26 and IC27 as possible.

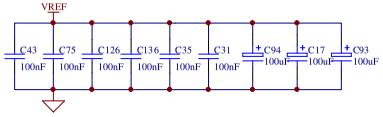


Mounting holes

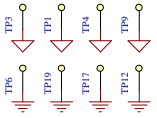


Video power connector

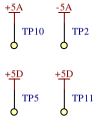




VGND & DGND Testpoints



+5D,+5A,-5A Testpoints



Title: *Miscellaneous circuits*

Author:

Project: NAD S170

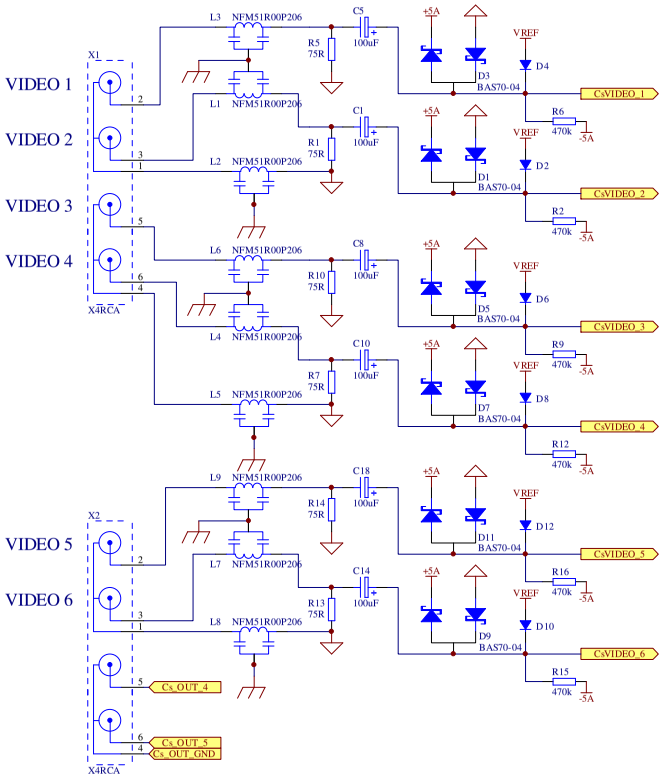
Revision: 2.2b

Size: A3

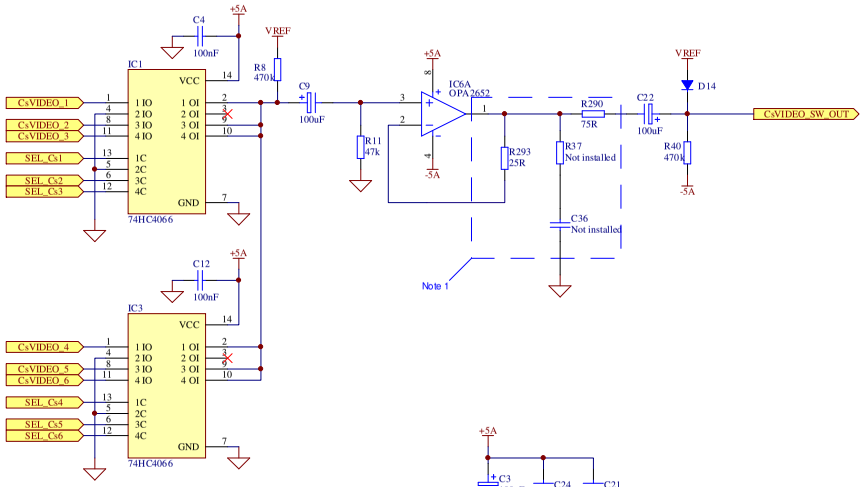
Date: 17-May-2002 Time: 13:20:55 Sheet7 of 11

File:

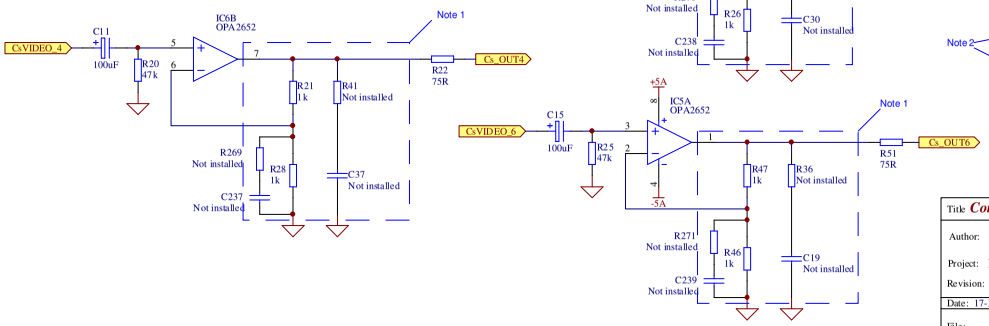
Composite video inputs



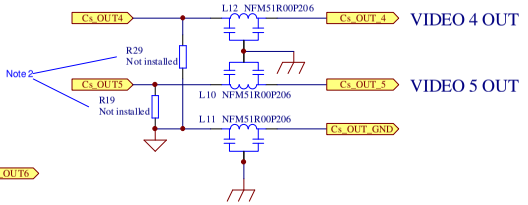
Composite video selectors & buffers



Composite Out Buffering

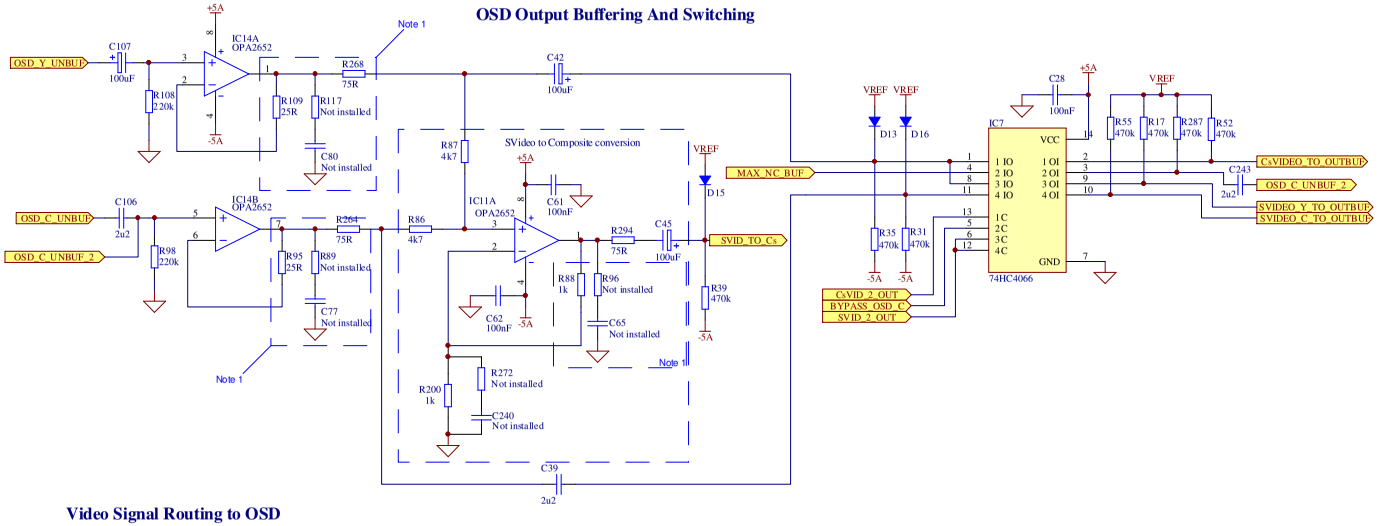


Composite video 4 & 5 outputs

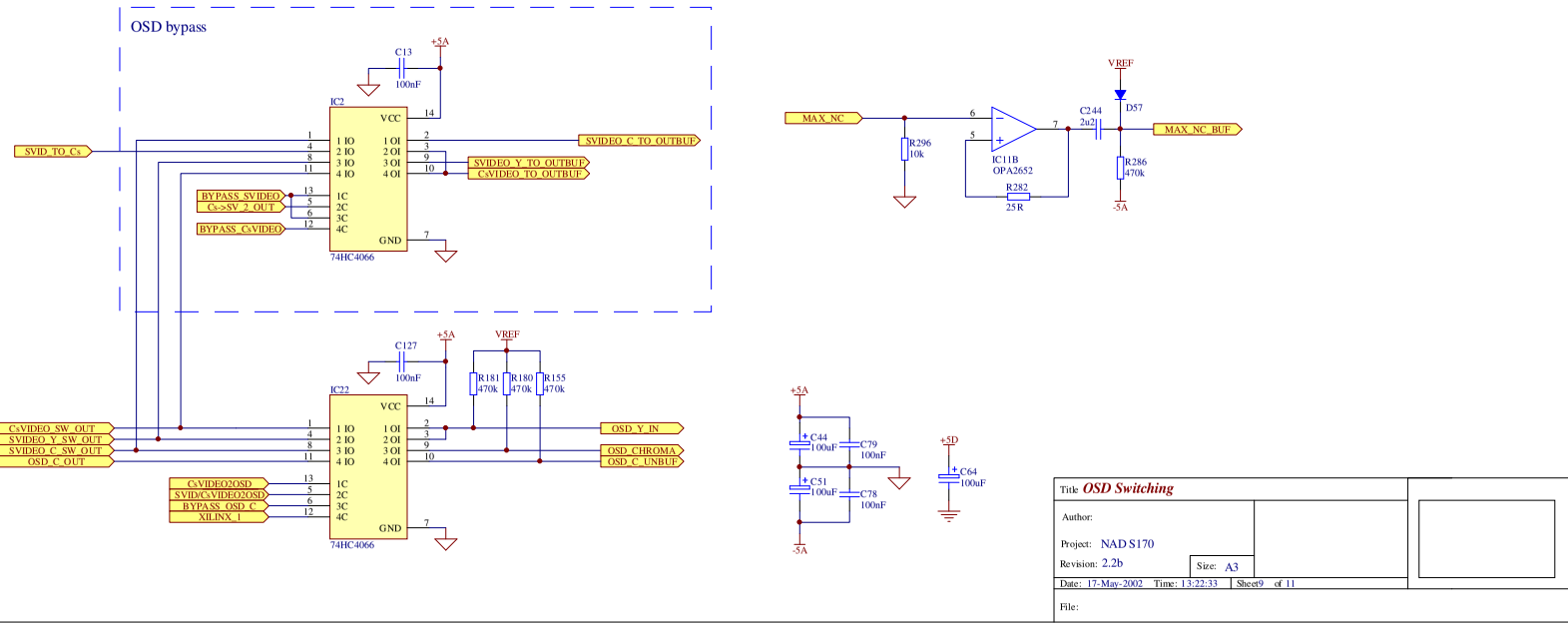


Title	*Composite video switching*
Author:	
Project:	NAD S170
Revision:	2.2b
Size:	A3
Date:	17-May-2002
Time:	13:21:47
Sheet	8 of 11
File:	

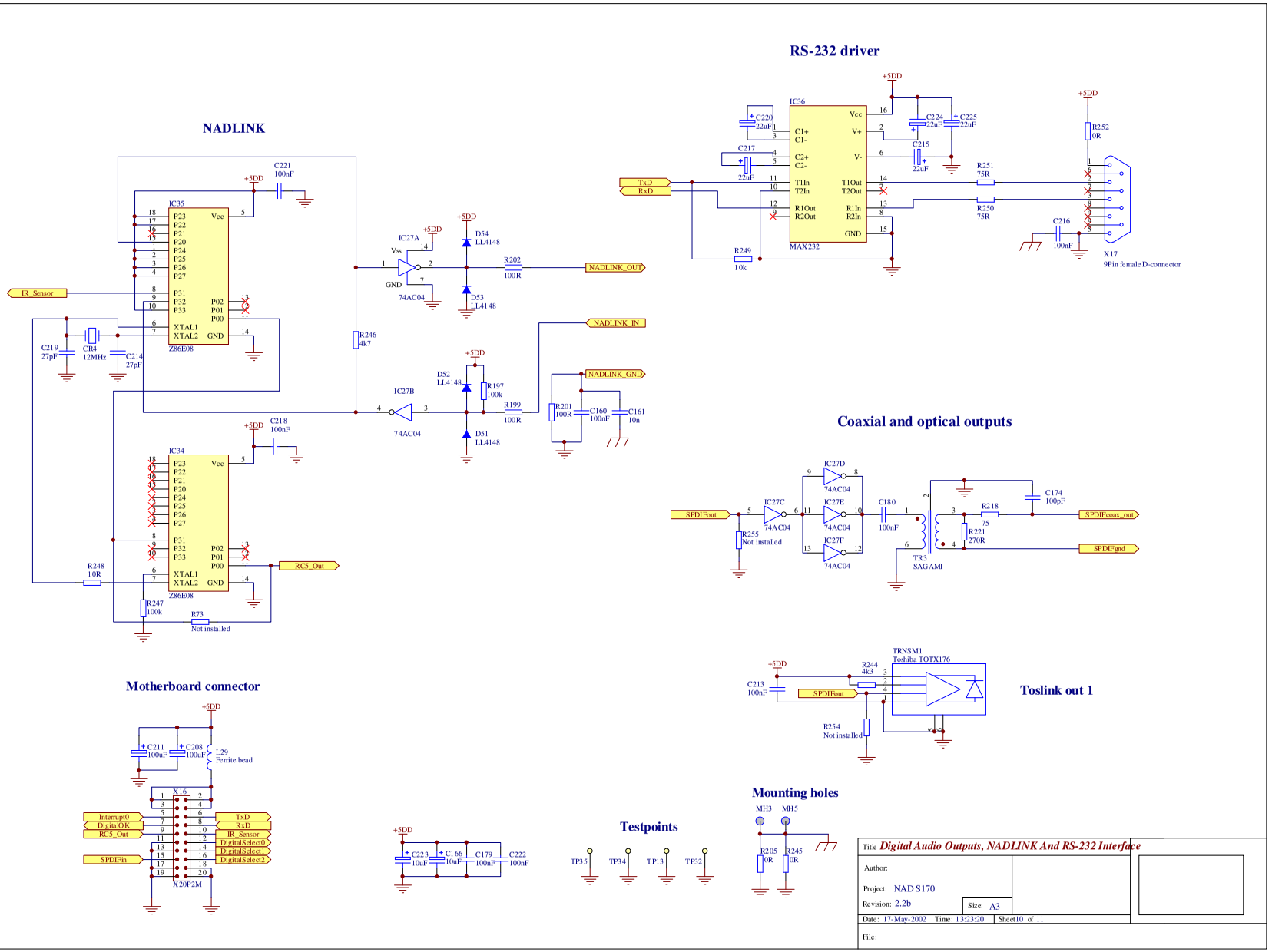
OSD Output Buffering And Switching

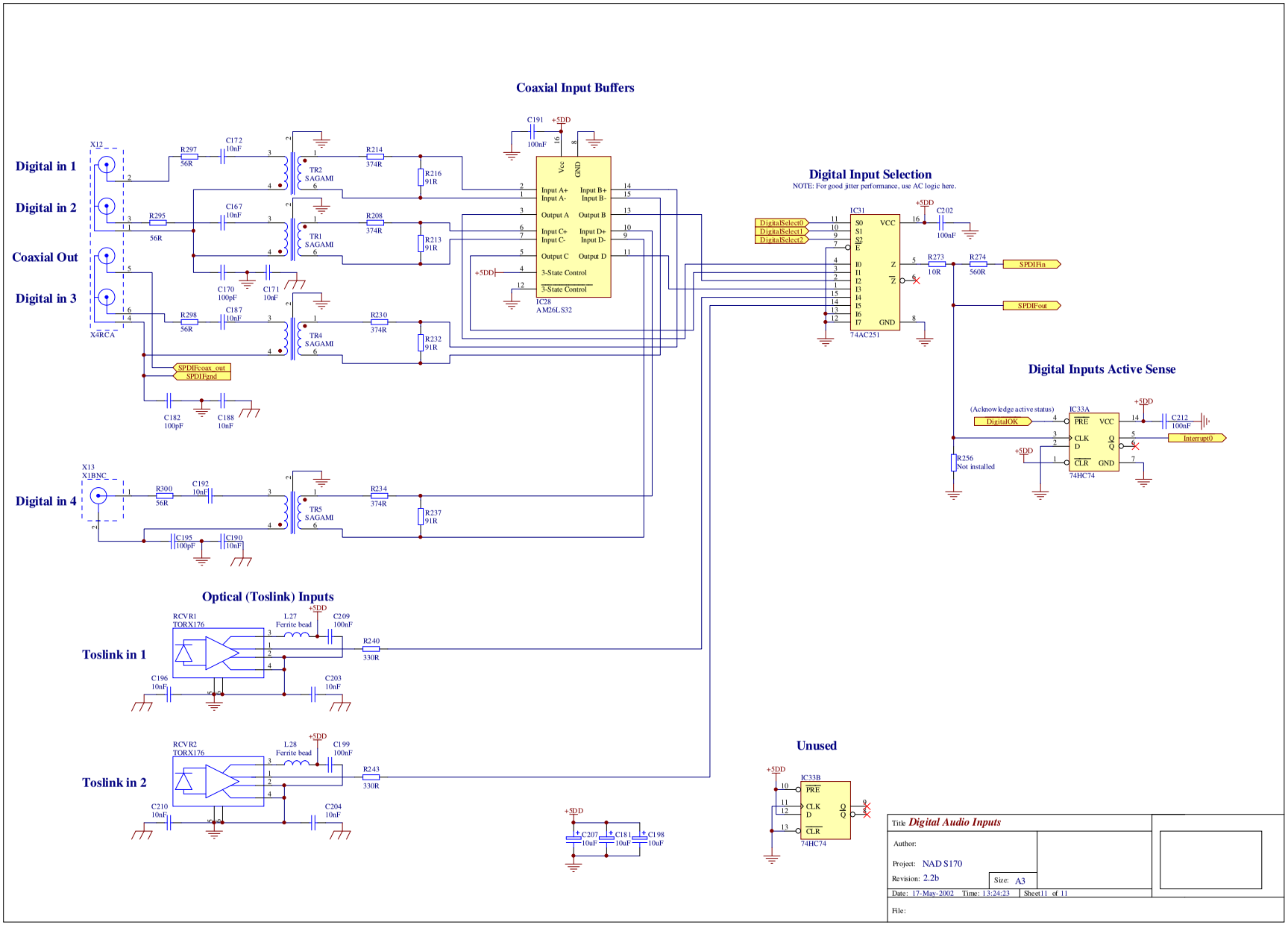


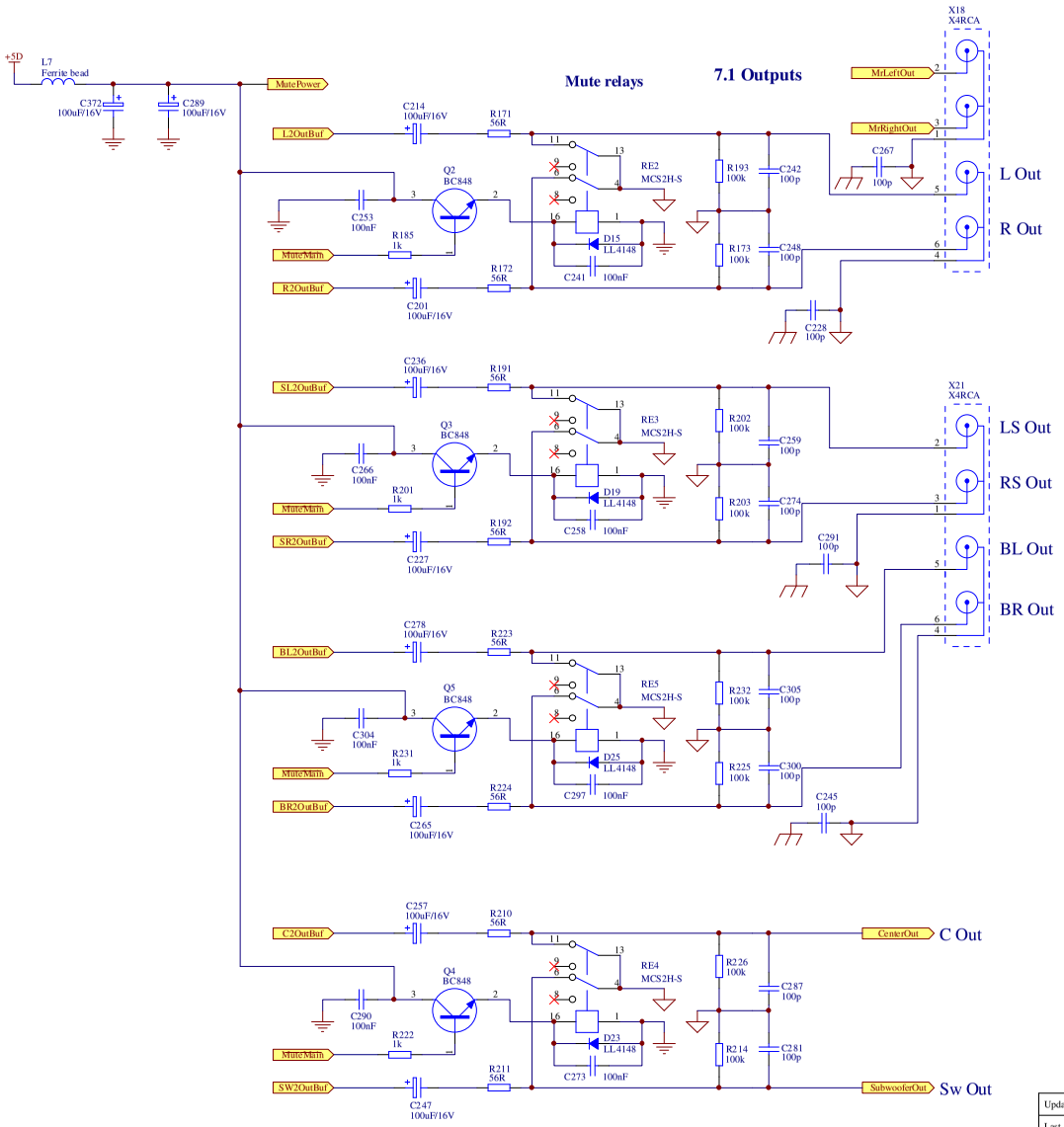
Video Signal Routing to OSD



Title	*OSD Switching*
Author:	
Project:	NAD S170
Revision:	2.2b
Size:	A3
Date:	17-May-2002
Time:	13:22:33
Sheet	9 of 11
File:	


RS-232 driver
NADLINK
Coaxial and optical outputs
Motherboard connector
Toslink out 1
Mounting holes
Testpoints
IC36
MAX232
IC35
IC34
Z86E08
IC27A
IC27B
IC27C
IC27D
IC27E
IC27F
74AC04
TR3
SAGAMI
X17
9Pin female D-connector
X16
X20P2M
TRNSM1
Toshiba TOTX176
MH3
MH5
TP35
TP34
TP13
TP32
+5DD
TxD
RxD
IR_Sensor
NADLINK_OUT
NADLINK_IN
NADLINK_GND
RC5_Out
SPDIFout
SPDIFcoax_out
SPDIFgnd
SPDIFin
Interrupt0
DigitalOK
RC5_Out
TxD
RxD
IR_Sensor
DigitalSelect0
DigitalSelect1
DigitalSelect2
Not installed
Ferrite bead
Title Digital Audio Outputs, NADLINK And RS-232 Interface
Author:
Project: NAD S170
Revision: 2.2b
Size: A3
Date: 17-May-2002 Time: 13:23:20 Sheet 10 of 11
File:


Coaxial Input Buffers
Digital in 1
Digital in 2
Coaxial Out
Digital in 3
Digital in 4
X12
X4RCA
X13
X1BNC
R297 56R
R295 56R
R298 56R
R300 56R
C172 10nF
C167 10nF
C187 10nF
C192 10nF
C170 100pF
C171 10nF
C182 100pF
C188 10nF
C195 100pF
C190 10nF
TR2 SAGAMI
TR1 SAGAMI
TR4 SAGAMI
TR5 SAGAMI
R214 374R
R208 374R
R230 374R
R234 374R
R216 91R
R213 91R
R232 91R
R237 91R
SPDIFcoax_out
SPDIFgnd
C191 100nF
+5DD
IC28
AM26LS32
Input A+
Input A-
Input B+
Input B-
Output A
Output B
Input C+
Input C-
Input D+
Input D-
Output C
Output D
3-State Control
Vcc
GND
Digital Input Selection
NOTE: For good jitter performance, use AC logic here.
DigitalSelect0
DigitalSelect1
DigitalSelect2
IC31
74AC251
C202 100nF
R273 10R
R274 560R
SPDIFin
SPDIFout
Digital Inputs Active Sense
(Acknowledge active status)
DigitalOK
IC33A
74HC74
C212 100nF
Interrupt0
R256 Not installed
Optical (Toslink) Inputs
Toslink in 1
Toslink in 2
RCVR1 TORX176
RCVR2 TORX176
L27 Ferrite bead
L28 Ferrite bead
C209 100nF
C199 100nF
R240 330R
R243 330R
C196 10nF
C203 10nF
C210 10nF
C204 10nF
C207 10uF
C181 10uF
C198 10uF
Unused
IC33B
74HC74
Title Digital Audio Inputs
Author:
Project: NAD S170
Revision: 2.2b
Size: A3
Date: 17-May-2002 Time: 13:24:23 Sheet 11 of 11
File:



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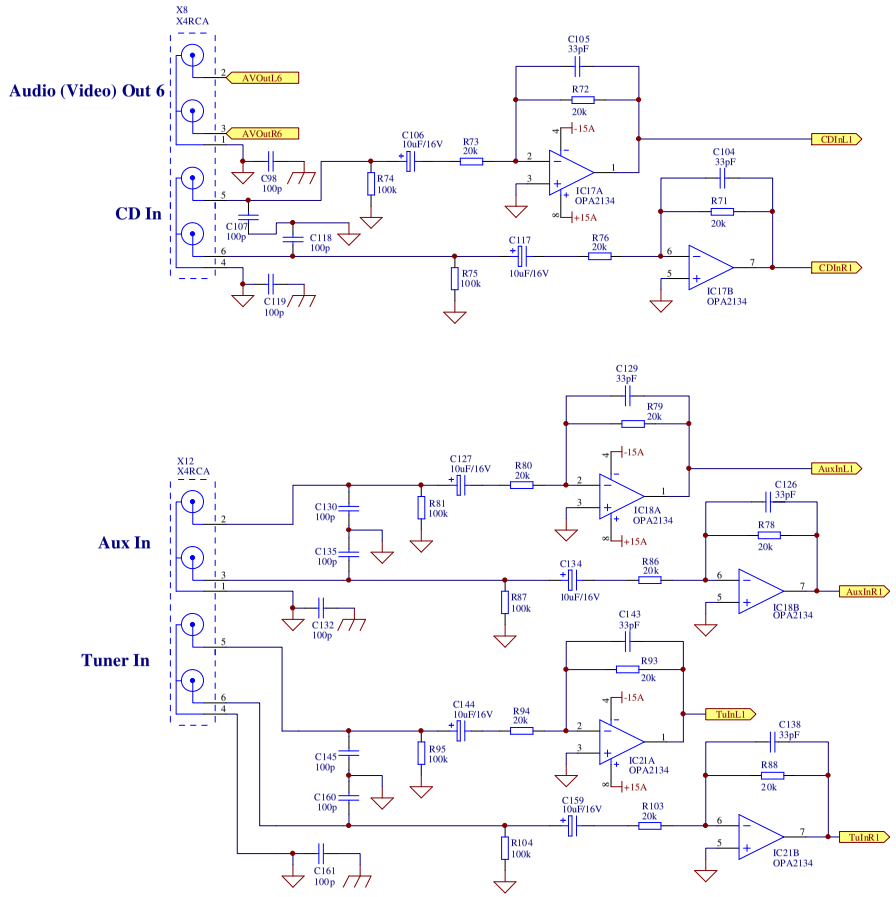
NAD Electronics		
	Title: Multichannel Outputs	Design Code:
	Customer Name: NAD ELECTRONICS	Model No: S170
Updated: April.17.2001	Drawn By:	Product Code: N0990C
Last Modified:	Modified By:	Version: B
Drawing Created:	Approved By:	Sheet: 2 of 14



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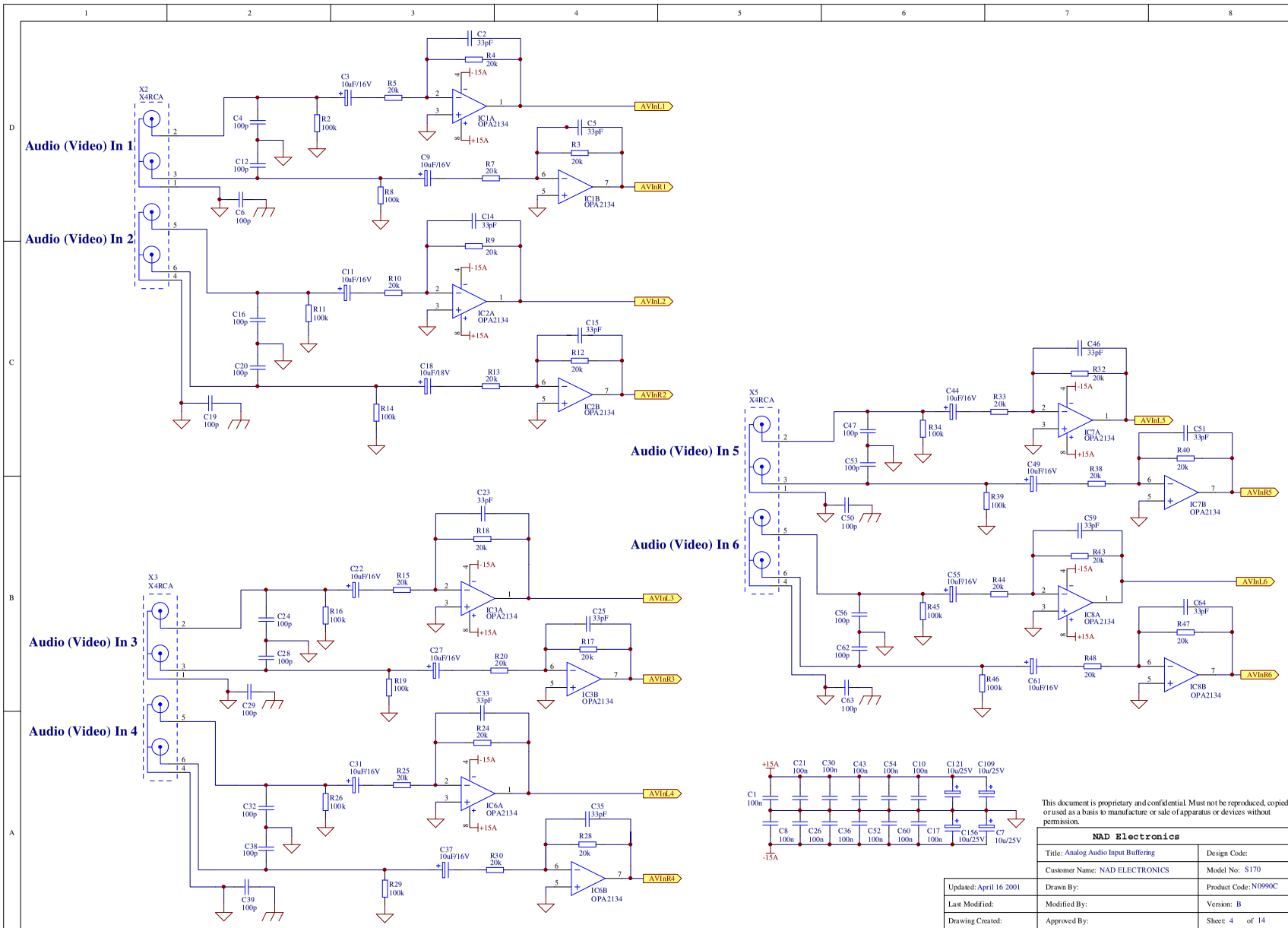
NAD Electronics		
	Title: Analog Audio Input Buffering	Design Code:
	Customer Name: NAD ELECTRONICS	Model No: S170
Updated: April 16 2001	Drawn By:	Size: A3
Last Modified:	Modified By:	Version: B
Drawing Created:	Approved By:	Sheet: 3 of 14



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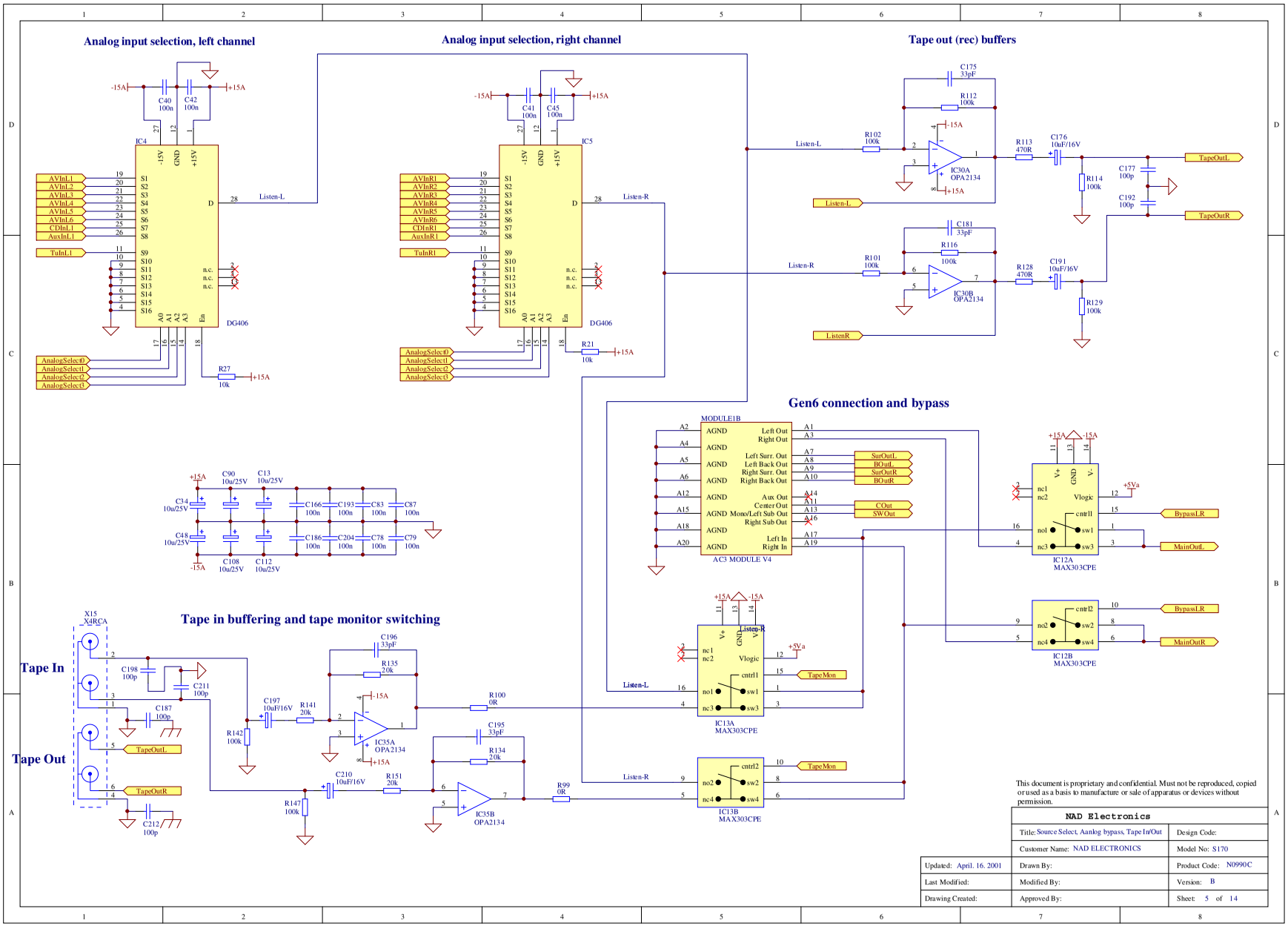
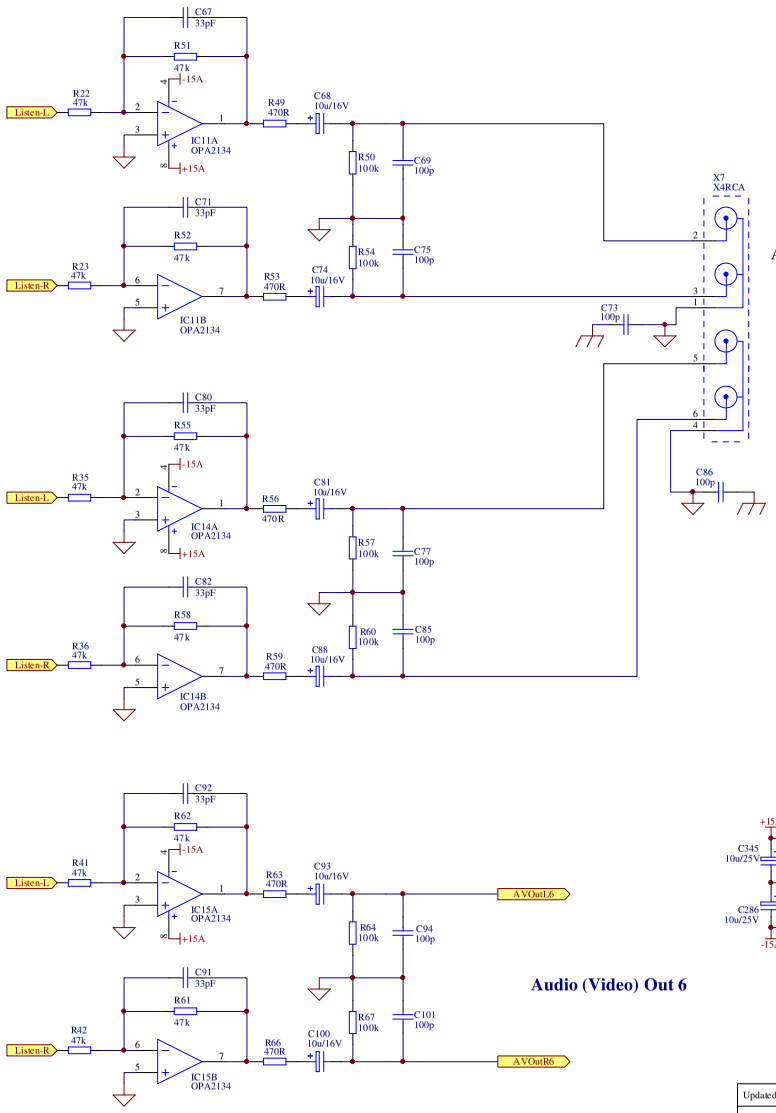
NAD Electronics	
Title: Analog Audio Input Buffering	Design Code:
Customer Name: NAD ELECTRONICS	Model No: S170
Updated: April 16 2001	Drawn By:	Product Code: N0990C
Last Modified:	Modified By:	Version: B
Drawing Created:	Approved By:	Sheet: 4 of 14


Analog input selection, left channel
Analog input selection, right channel
Tape out (rec) buffers
Gen6 connection and bypass
Tape in buffering and tape monitor switching
Tape In
Tape Out
IC4
IC5
DG406
Listen-L
Listen-R
TapeOutL
TapeOutR
MainOutL
MainOutR
BypassLR
TapeMon
IC30A OPA2134
IC30B OPA2134
IC35A OPA2134
IC35B OPA2134
MODULE1B
AC3 MODULE V4
IC12A MAX303CPE
IC12B MAX303CPE
IC13A MAX303CPE
IC13B MAX303CPE
X15 X4RCA
This document is proprietary and confidential. Must not be reproduced, copied or used as a basis to manufacture or sale of apparatus or devices without permission.
NAD Electronics
Title: Source Select, Aanlog bypass, Tape In/Out
Design Code:
Customer Name: NAD ELECTRONICS
Model No: S170
Updated: April. 16. 2001
Drawn By:
Product Code: N0990C
Last Modified:
Modified By:
Version: B
Drawing Created:
Approved By:
Sheet: 5 of 14



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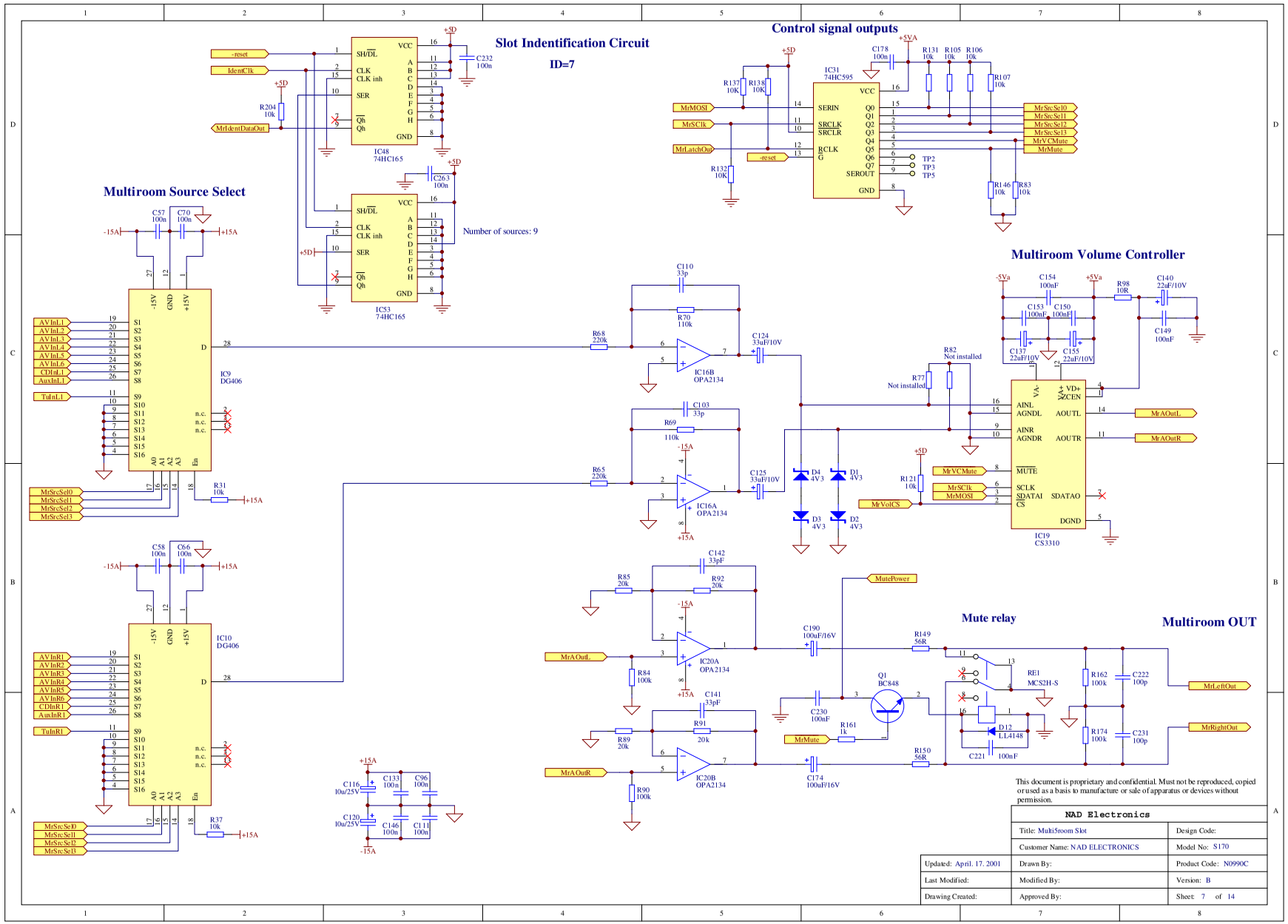
NAD Electronics		
	Title: Output Buffering	Design Code:
	Customer Name: NAD ELECTRONICS	Model No: S170
Updated: April 16 2001	Drawn By:	Product Code: N0990C
Last Modified:	Modified By:	Version: B
Drawing Created:	Approved By:	Sheet: 6 of 14



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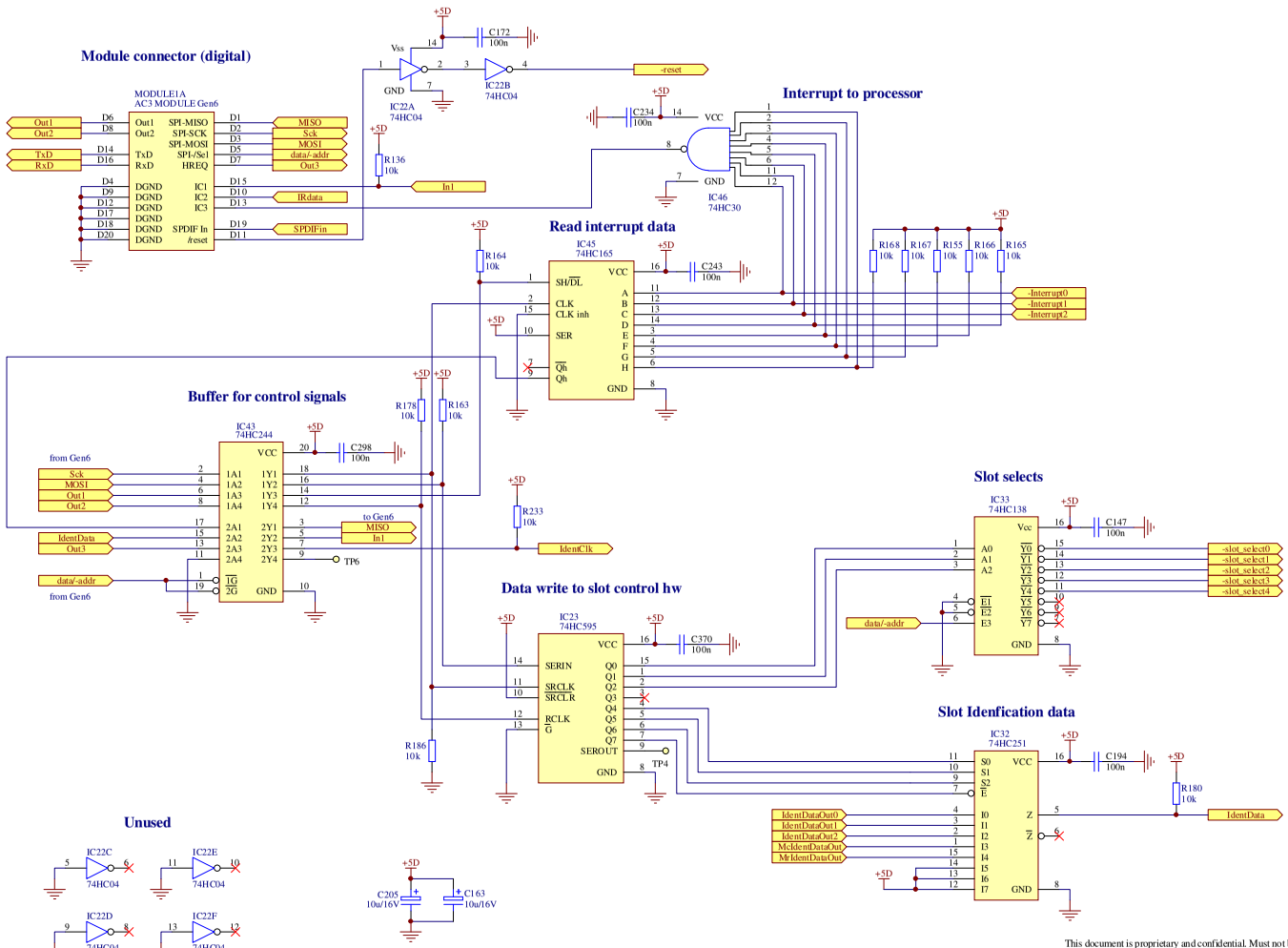
NAD Electronics	
Title: Multi5room Slot	Design Code:
Customer Name: NAD ELECTRONICS	Model No: S170
Updated: April. 17. 2001	Drawn By:
Last Modified:	Modified By:
Drawing Created:	Approved By:
	Product Code: N0990C
	Version: B
	Sheet: 7 of 14



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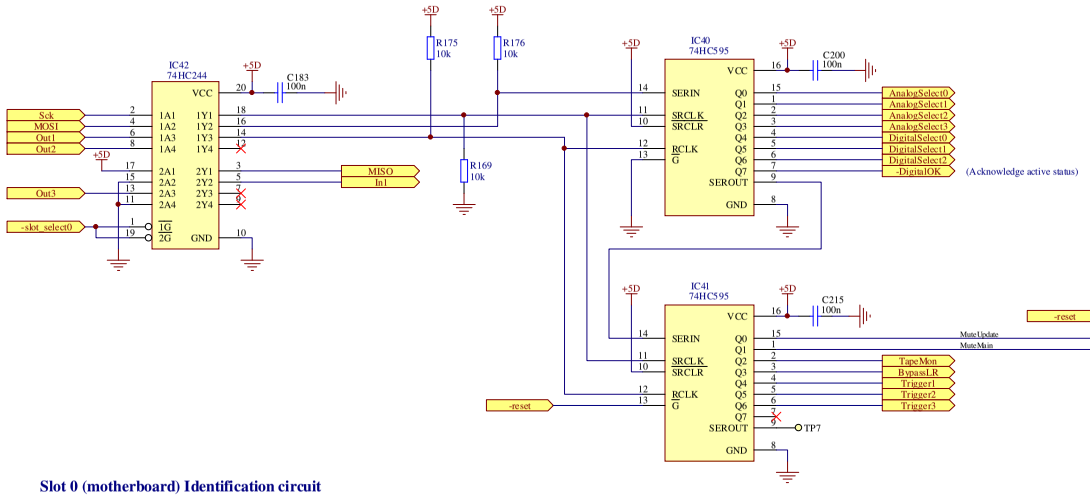
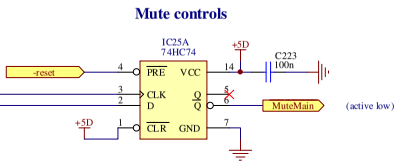
NAD Electronics		
	Title: Device Slots	Design Code:
	Customer Name: NAD ELECTONICS	Model No: S170
Updated: April. 17. 2001	Drawn By:	Product Code: N0990C
Last Modified:	Modified By:	Version: B
Drawing Created:	Approved By:	Sheet: 8 of 14

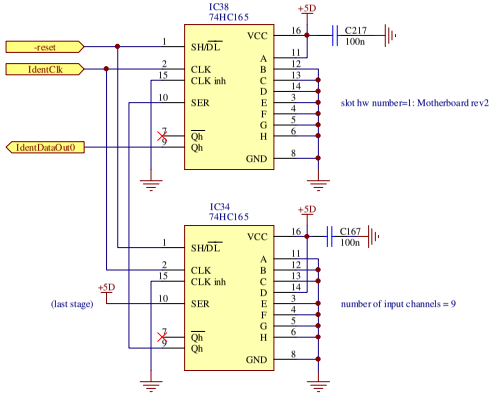
Motherboard data write



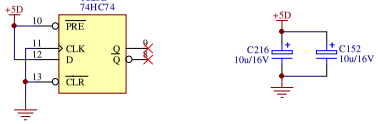
Mute controls



Slot 0 (motherboard) Identification circuit



Unused



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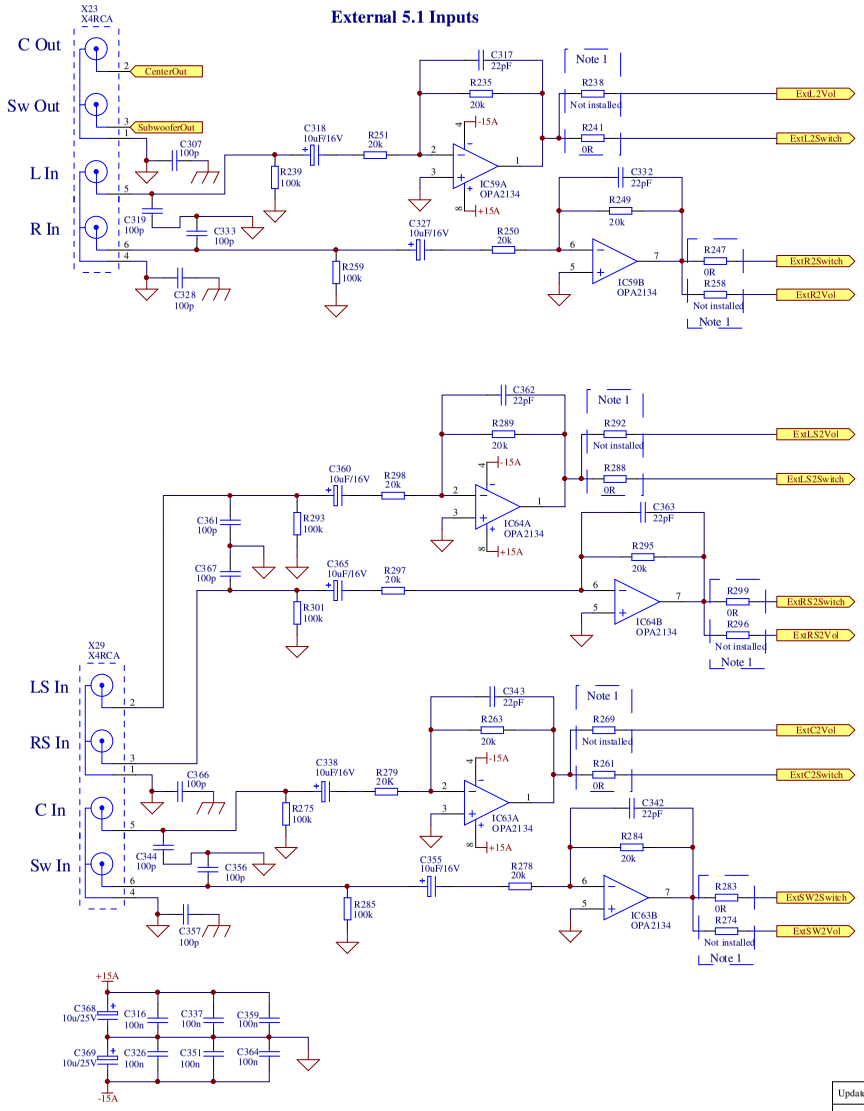
NAD Electronics		
	Title: CONTROL LOGIC	Design Code:
	Customer Name: NAD ELECTRONICS	Model No: S170
Updated: April. 17. 2001	Drawn By:	Product Code: N0990C
Last Modified:	Modified By:	Version: B
Drawing Created:	Approved By:	Sheet: 9 of 14

External 5.1 Inputs



Note 1:
Volume controllers are placed between the switch and outputs.
If volume controllers are wanted to be placed between inputs and the switch, replace uninstalled resistors with 0R and uninstall all 0R's.

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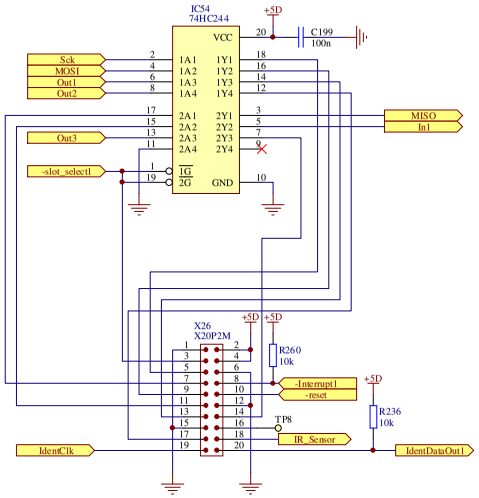
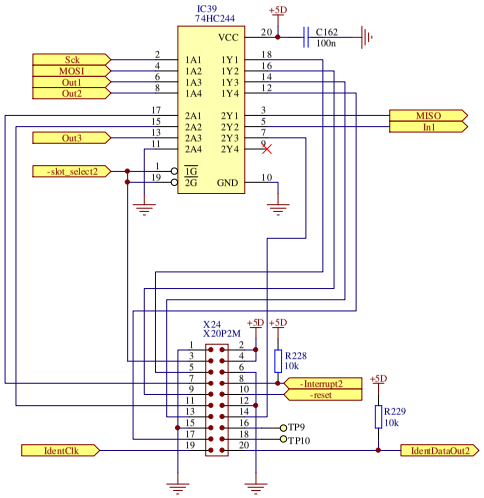
NAD Electronics		
	Title: Multichannel Inputs	Design Code:
	Customer Name: NAD ELECTRONICS	Model No: S170
Updated: April. 16.2001	Drawn By:	Product Code: N0990C
Last Modified:	Modified By:	Version: B
Drawing Created:	Approved By:	Sheet: 10 of 14

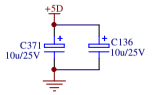
Device Slot buffers and connectors

Slot 1 (frontpanel)

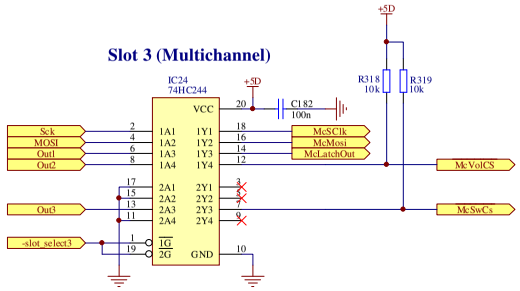


Slot 2 (videoboard)

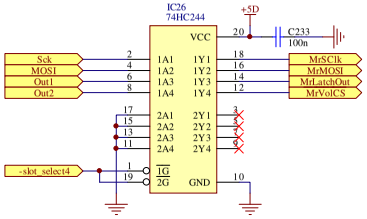




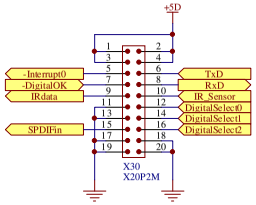
Slot 3 (Multichannel)



Slot 4 (Multiroom)



Digital audio connector



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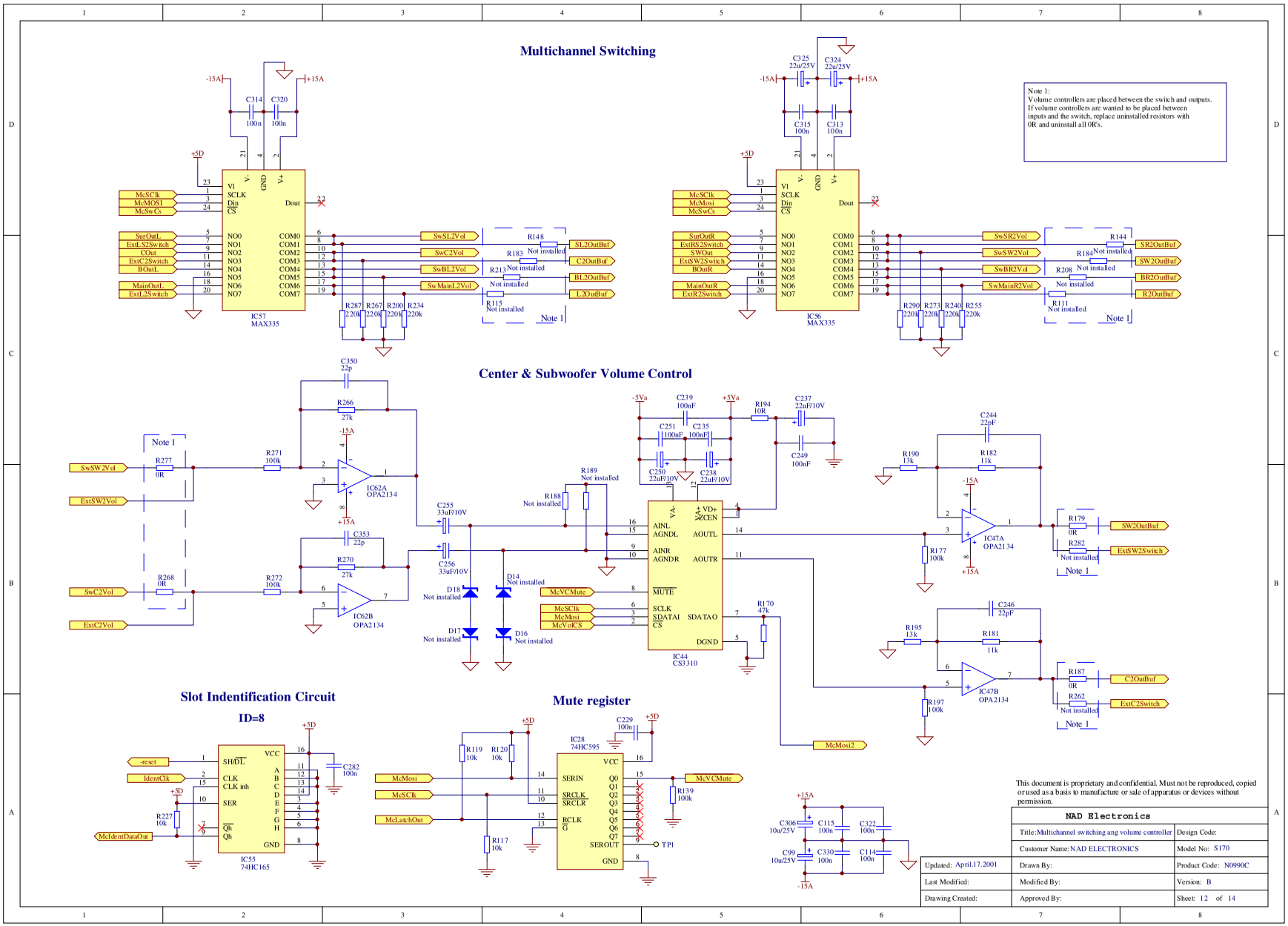
NAD Electronics		
	Title: Slot connections	Design Code:
	Customer Name: NAD ELECTRONICS	Model No: S170
Updated: April. 17. 2001	Drawn By:	Product Code: N0990C
Last Modified:	Modified By:	Version: B
Drawing Created:	Approved By:	Sheet: 11 of 14


Multichannel Switching
Center & Subwoofer Volume Control
Slot Indentification Circuit
ID=8
Mute register
Note 1:
Volume controllers are placed between the switch and outputs.
If volume controllers are wanted to be placed between
inputs and the switch, replace uninstalled resistors with
0R and uninstall all 0R's.
IC57 MAX335
IC56 MAX335
IC62A OPA2134
IC62B OPA2134
IC47A OPA2134
IC47B OPA2134
IC44 CS3310
IC55 74HC165
IC28 74HC595
Not installed
Note 1
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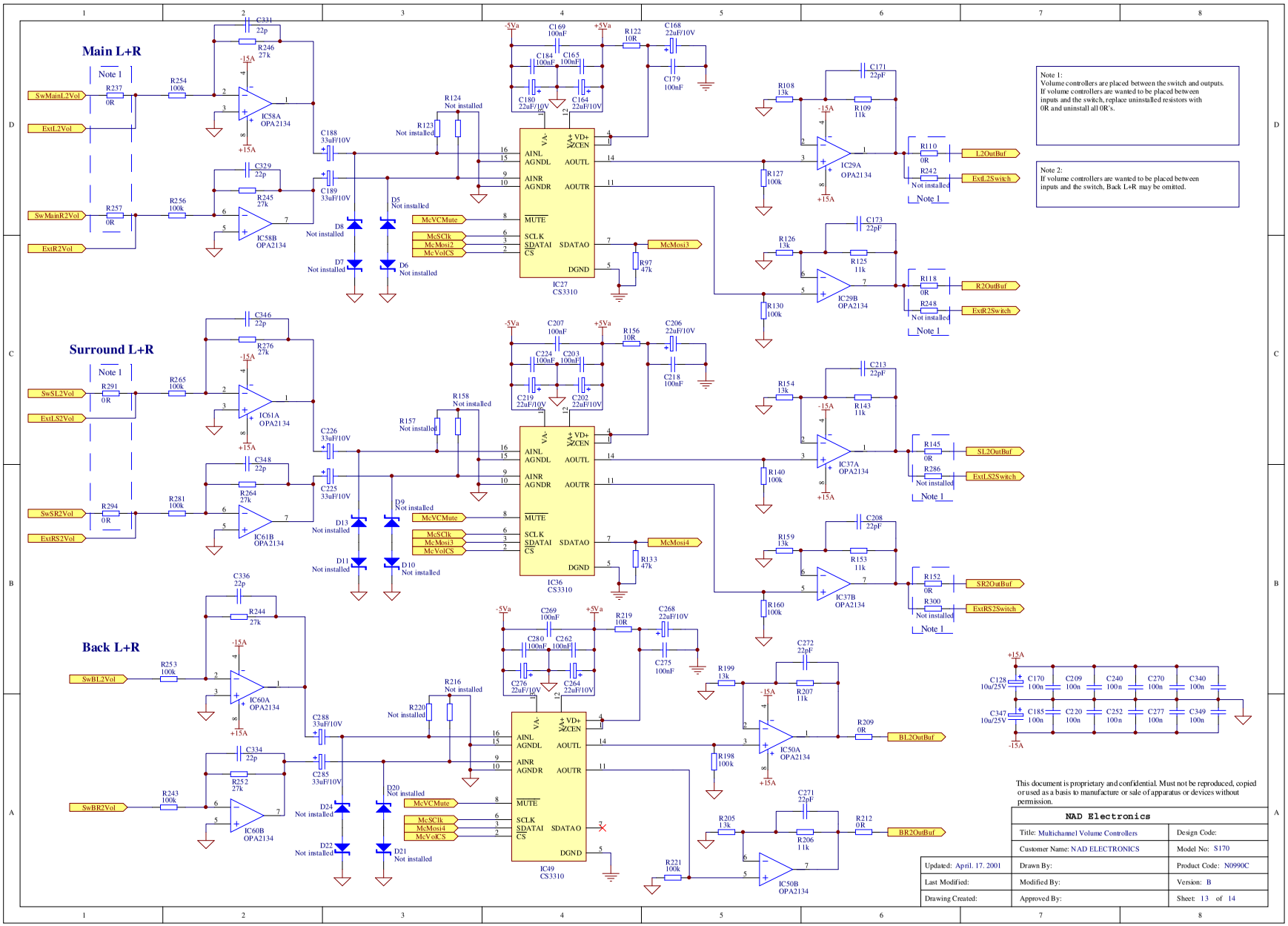
NAD Electronics
Title: Multichannel switching ang volume controller
Design Code:
Customer Name: NAD ELECTRONICS
Model No: S170
Updated: April.17.2001
Drawn By:
Product Code: N0990C
Last Modified:
Modified By:
Version: B
Drawing Created:
Approved By:
Sheet: 12 of 14


Main L+R
Surround L+R
Back L+R
Note 1
SwMainL2Vol
ExtL2Vol
SwMainR2Vol
ExtR2Vol
SwSL2Vol
ExtLS2Vol
SwSR2Vol
ExtRS2Vol
SwBL2Vol
SwBR2Vol
IC58A OPA2134
IC58B OPA2134
IC61A OPA2134
IC61B OPA2134
IC60A OPA2134
IC60B OPA2134
IC27 CS3310
IC36 CS3310
IC49 CS3310
IC29A OPA2134
IC29B OPA2134
IC37A OPA2134
IC37B OPA2134
IC50A OPA2134
IC50B OPA2134
McVCMute
McSClk
McMosi2
McMosi3
McMosi4
McVolCS
L2OutBuf
R2OutBuf
SL2OutBuf
SR2OutBuf
BL2OutBuf
BR2OutBuf
ExtL2Switch
ExtR2Switch
ExtLS2Switch
ExtRS2Switch
Not installed
Note 1:
Volume controllers are placed between the switch and outputs.
If volume controllers are wanted to be placed between inputs and the switch, replace uninstalled resistors with 0R and uninstall all 0R's.
Note 2:
If volume controllers are wanted to be placed between inputs and the switch, Back L+R may be omitted.
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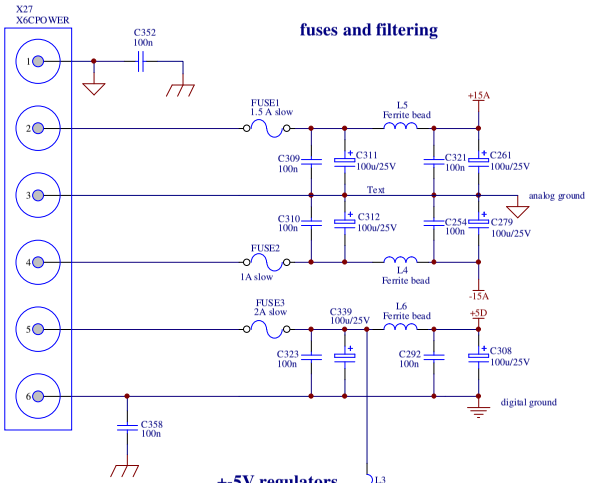
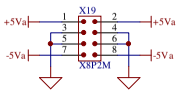
NAD Electronics
Title: Multichannel Volume Controllers
Design Code:
Customer Name: NAD ELECTRONICS
Model No: S170
Updated: April. 17. 2001
Drawn By:
Product Code: N0990C
Last Modified:
Modified By:
Version: B
Drawing Created:
Approved By:
Sheet 13 of 14

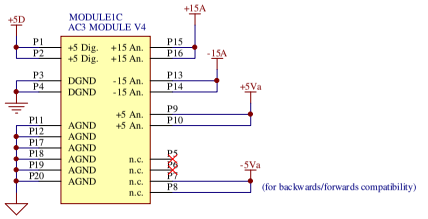
DC power input



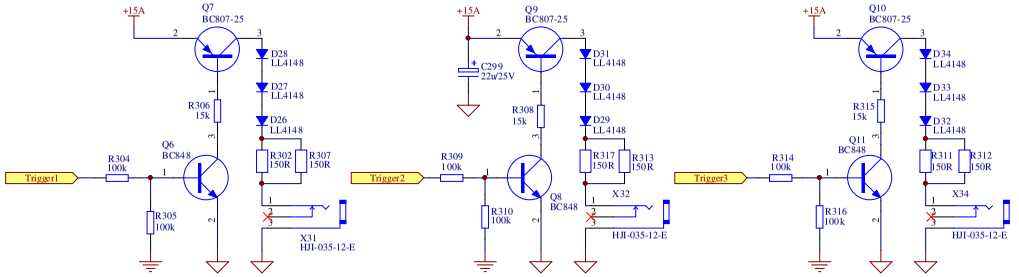
Videoboard analog power connector



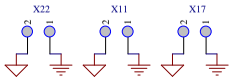
Module connector (power)



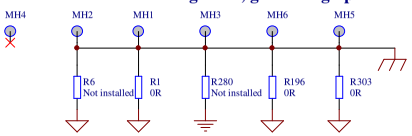
Triggers



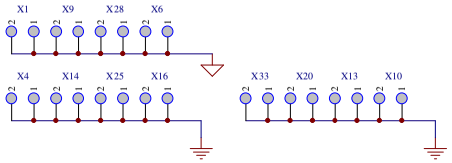
Ground connections (Not installed)

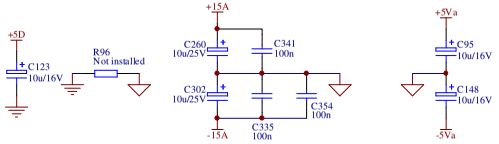


Mounting holes, grounding options



Scope Hooks (Not installed)





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NAD Electronics		
	Title: Power supply connection &regulation	Design Code:
	Customer Name:NAD ELECTONICS	Model No: S170
Updated: April. 17. 2001	Drawn By:	Product Code: N0990C
Last Modified:	Modified By:	Version: B
Drawing Created:	Approved By:	Sheet: 14 of 14

ELECTRICAL PARTS LIST

Location	Part Number	Description
PCB ASSY KEY		
PCB BOARD		
2000	**PCB-N0990C-KEY**	**PCB ASSY KEY**
CAPACITORS		
C38,C39	150F-102K-J-BD	CC 50V 1000pF 10% 0805 1
C40	150F-103K-J-BD	CC 50V 0.01U 10% 0805
C1-C7,C9-C27,C41	150F-104K-J-BD	CC 50V 0.1uF 10% 0805
C35	150F-223K-J-BD	CC 50V 0.022U 10% 0805
C28-C34	154C-107K-3-HN	CT 10V 100uF 10% SM
WAFERS		
S-2	2101-0831-0	WAFER 10PIN P2.54 DUAL
S-1	2101-1369-0	CONN.7x2PIN DUAL ROW
LCD		
LCD1	2460-1450-0	VF DISPLAY VFD116X37 NOR
IC		
IC4,IC5	3130-6590-0	IC 74HC74 DUAL D-TYPE
IC9	3130-8740-0	IC 74HC138 SOP PACKAGE
IC6	3131-9050-0	IC 74HC00 QUAD 2I/P NAND
IC7,IC8	3131-9500-0	IC 74HC595AF 8BIT SHIFT
IC1,IC2,IC3	3131-9520-0	IC 74HC165AF SHIFT
LED		
	3700-3538-B	LED 3MM FLAT TOP BLUE
RESISTOR		
R37-R46	4720-000J-J	RMG 1/10W 0R 5% 0805

ELECTRICAL PARTS LIST

Location	Part Number	Description
R34	4720-102J-J	RMG 1/10W 1K 5% 0805
R18-R21,R26-R33,R49	4720-103J-J	RMG 1/10W 10K 5% 0805
R11-R13	4720-104J-J	RMG 1/10W 100K 5% 0805
R22,R23	4720-124J-J	RMG 1/10W 120K 5% 0805
R24,R25	4720-203J-J	RMG 1/10W 20K 5% 0805
R36	4720-223J-J	RMG 1/10W 22K 5% 0805
R35	4720-331J-J	RMG 1/10W 330R 5% 0805
R48	4720-471A-J	RMG 1/10W 470R 1% 0805
R1-R10,R14-R16	4720-472J-J	RMG 1/10W 4.7K 5% 0805
R17	4720-473J-J	RMG 1/10W 47K 5% 0805
R47	4720-682J-J	RMG 1/10W 6.8K 5% 0805
DIODES		
D1-D15	4840-1080-3	RLS-73 DIODE
TRANSISTOR		
Q1	485C-848C-3	TR BC848C (1LP) HFE
SWITCH		
SW1-SW10	5200-3011-0-01	TACT SWITCH 4P
MISCELLANEOUS		
REC1	4152-4671-0	RUBBER PAD 8X8X3
REC1	481P-1736-0	IR RECEIVER TSOP1736

PCB ASSY VOLUME
PCB BOARD

	PCB-N0990C-KEY1	**PCB ASSY VOLUME**
WAFERS		
J207A	2101-1375-0	WAFER 3PIN P2/54 STRIGHT
SEMI FIXED		
M301	4750-6000-0	ROTARY ENCODER

ELECTRICAL PARTS LIST

Location	Part Number	Description
PCB ASSY MAIN N0990C		
PCB BOARD		
	PCB-N0990C-MAIN	**PCB ASSY MAIN**
CAPACITORS		
C283,C284	150E-334K-J-BD	CC 25V 0.33uF 10% 0805
C4,C6,C12,C16,C19,C20,C24, C28,C29,C32,C38,C39,C47, C50,C53,C56,C62,C63,C69, C73,C75,C77,C85,C86,C94, C98,C101,C107,C118,C119, C130,C132,C135,C145,C160, C161,C177,C187,C192,C198, C211,C212,C222,C228,C231, C242,C245,C248,C259,C267, C274,C281,C287,C291,C300, C305,C307,C319,C328,C333, C344,C356,C357,C361,C366, C367,	150F-101K-J-BD	CC 50V 100P 10% 0805
C101,C111,C113,C136,C140, C301,C302,C310,C322,C350, C380,C381,C386,C401, C403-C405,C412,C417, C501-C505,C521,C526,C528, C532,C534,C535,C540-C543, C703	150F-104K-5-II	CC 50V 0.1uF 10% RL 5x5
C1,C8,C10,C17,C21,C26,C30, C36,C40-C45,C52,C54,C57, C58,C60,C65,C66,C70,C72, C76,C78,C79,C83,C84,C87, C89,C96,C97,C102,C111, C113-C115,C122,C131,C133, C139,C146,C147,C149-C151,	150F-104K-J-BD	CC 50V 0.1uF 10% 0805

ELECTRICAL PARTS LIST

Location	Part Number	Description
C153,C154,C162,C165,C166, C167,C169,C170,C172,C178, C179,C182,C183,C184-C186, C193,C194,C199,C200,C203, C204,C207,C209,C215,C217, C218,C220,C221,C223,C224, C229,C230,C232-C235, C239-C241,C243,C249, C251-C253,C254,C258,C262, C263,C266,C269,C270,C273, C275,C277,C280,C282,C290, C292,C296,C297,C298,C303, C304,C309,C310,C313-C316, C320-C323,C326,C330,C335, C337,C340,C341,C349,C351, C352,C354,C358,C359,C364, C370,		
C343	150F-220K-J-BD	CC 50V 22P 10% 0805
C2,C5,C14,C15,C23,C25, C33,C35,C46,C51,C59,C64, C67,C71,C80,C82,C91,C92 C103-C105,C110,C126,C129, C138,C141,C142,C143, C175,C181,C195,C196,	150F-330J-J-BD	CC 50V 33pF 5% 0805 1.2x
C188,C189,C225,C226, C255,C256,C285,C288	154C-336M-3-EF	CT 10V 33uF 20% SM
C95,C123,C148,C152,C163, C205,C216,C293,C294,	154D-106M-3-EF	CT 16V 10uF 20% SM
C7,C13,C34,C48,C90,C99	154E-106M-3-FK	CT 25V 10uF 20% 3.2x6 SM
C108,C109,C112,C116,C120, C121,C128,C136,C156-C158, C260,C286,C295,C301,C302, C306,C345,C347,C368,C369, C371,		
C137,C140,C155,C164,C168,	157C-226M-3-JJ	CE 10V 22uF 20% 5.3x5.4

ELECTRICAL PARTS LIST

Location	Part Number	Description
C180,C202,C206,C219,C237, C238,C250,C264,C268,C276		
C124,C125	157C-336M-3-JJ	CE 10V 33uF 20% 5.3x5.4
C3,C9,C11,C18,C22,C27,C31, C37,C44,C49,C55,C61,C68, C74,C81,C88,C93,C100,C106, C117,C127,C134,C144,C159, C176,C191,C197,C210,C318, C327,C338,C355,C360,C365,	157D-106M-3-GJK	CE 16V 10uF 20% 4X5.4 SM
C174,C190,C201,C214, C227,C236,C247,C257, C265,C278,C289,C372	157D-107M-3-MJ	CE 16V 100uF 20% SM
C261,C279,C308,C311, C312,C339	157E-107M-3-OJ	CE 25V 100uF 20% 8X5.5
C299,C324,C325	157E-226M-3-LJ	CE 25V 22uF 20% 6.3X5.4
C171,C173,C208,C213,C244, C246,C271,C272,C317,C329, C331,C332,C334,C336,C342, C346,C348,C350,C353,C362, C363	15CG-220J-J-BD	CTC 0/30 22pF 5% 0805
WAFERS/JACKS		
A,C,B	2101-0821-0	10 PIN P2.54 CONNECTOR
X26,X24,X30	2101-0831-0	WAFER 10PIN P2.54 DUAL
X27	2101-1367-0	WAFFER 6P P5.0 STRAIGHT
X19	2101-1368-0	REDEPTACLE 8PIN DUAL
X17	2102-8002-3-100	WAFER 2 PIN 9MM
X31,X32,X34	2113-1743-0	MONO JACK HTJ-035-12E
X2,X3,X5,X7,X8,X12X15,X18,X21,	2113-1750-0	4P RCA JACK R/W GOLD
X29	2113-1756-0	RCA JACK 4P W/R.BL GOLD
~~X2~~3	2113-1757-0	RCA JACK 4P BL.W/R GOLD
IC		
IC51	3130-2020-3	IC 7805 REG 5V 1.5A
IC52	3130-6360-0	IC 7905 -5V REG 1.5A

ELECTRICAL PARTS LIST

Location	Part Number	Description
IC25	3130-6590-0	IC 74HC74 DUAL D-TYPE
IC33	3130-8740-0	IC 74HC138 SOP PACKAGE
IC19,IC27,IC36,IC44,IC49,	3130-8860-0	IC CS3310 STEREO DIGITAL
IC4,IC5,IC9,IC10	3131-7260-0	IC DG506A SOP8 SMD
IC56,IC57	3131-7270-0	IC MAX335 SOP24 SMD
IC24,IC26,IC39,IC42,IC43,IC54	3131-7280-0	IC 74HC244 10x13 SOP20
IC32	3131-7290-0	IC 74HC251 SOP16
IC46	3131-7300-0	IC 74HC30 8-INPUT NAND
IC1-IC3,IC6-IC8,IC11,IC14-IC18,	3131-7310-0	IC OPA2134 SOP8 SMD
IC20,IC21,IC29,IC30,IC35,IC37		
IC47,IC50,IC58-IC64		
IC12,IC13	3131-7320-0	IC MAX303CPE SWITCH
IC22	3131-7340-0	IC 74HC04 HEX INVERTERS
IC31,IC41	3131-7570-0	IC 74HC594 8 bit SHIFT
IC28,IC23,IC40	3131-9500-0	IC 74HC595AF 8BIT SHIFT
IC34,IC38,IC45,IC48,IC53,IC55	3131-9520-0	IC 74HC165AF SHIFT
RELAY		
RE1-RE5	4500-0420-0	RELAY MCS2H-S
RESISTOR		
X31C,X32C,X34C	4715-472A-2	RMF 1/4W 4.7K 1% AT
R302,R307,R311-R313,R317	4719-101J-1-P	RMF 2W 100R 5% AL FP
R1,R99,R100,R110,R118,	4720-000J-J	RMG 1/10W 0R 5% 0805
R145,R152,R179,R187,R196,		
R209,R212,R237,R241,R247,		
R257,R261,R268,R277,R283,		
R288,R291,R294,R299,R303,		
R98,R122,R156,R194,R219	4720-100J-J	RMG 1/10W 10R 5% 0805
R161,R185,R201,R222,R231	4720-102J-J	RMG 1/10W 1K 5% 0805
R21,R27,R31,R37,R83,	4720-103J-J	RMG 1/10W 10K 5% 0805
R105-R107,R117,R119-R121,		
R131,R132,R136-R138,		
R146,R155,R163-R169,		
R175,R176,R178,R180,R186,		

ELECTRICAL PARTS LIST

Location	Part Number	Description
R204,R227-R229,R233,R236, R260,R318,R319, R2,R8,R11,R14,R16,R26, R29,R34,R39,R45,R46,R50, R54,R57,R60,R64,R67,R74, R75,R81,R84,R87,R90,R95, R101,R102,R104,R112,R114, R116,R127,R129,R130,R140, R142,R147,R160,R162,R173, R174,R177,R193,R197,R198, R202,R203,R214,R221,R225, R226,R232,R239,R259,R271, R272,R275,R285,R293,R301,	4720-104A-J	RMG 1/10W 100K 1% 0805
R19,R139,R304,R305,R309, R310,R314,R316	4720-104J-J	RMG 1/10W 100K 5% 0805
R109,R125,R143,R153, R206,R207	4720-113A-J	RMG 1/10W 11K 1% 0805
R69,R70	4720-114A-J	RMG 1/10W 110K 1% 0805
R108,R126,R154,R159, R199,R205	4720-133A-J	RMG 1/10W 13K 1% 0805
R306,R308,R315	4720-153J-J	RMG 1/10W 15K 5% 0805
R181,R182	4720-163J-J	RMG 1/10W 16K 5% 0805
R3,R4,R5,R7,R9,R10,R12, R13,R15,R17,R18,R20,R24, R25,R28,R30,R32,R33,R38, R40,R43,R44,R47,R48,R71-R73, R76,R78,R79,R80,R85, R86,R88,R89,R91-R94, R103,R134,R135,R141, R151,R235,R249-R251 R263,R278,R279,R284, R289,R295,R297,R298,	4720-203A-J	RMG 1/10W 20K 1% 0805
R65,R68,R200,R234,R240, R255,R267,R273,R287,R290	4720-224A-J	RMG 1/10W 220K 1% 0805
R218	4720-272J-J	RMG 1/10W 2.7K 5% 0805

ELECTRICAL PARTS LIST

Location	Part Number	Description
R266,R270	4720-273A-J	RMG 1/10W 27K 1% 0805
R244,R245,R246,R252, R264,R276	4720-333A-J	RMG 1/10W 33K 1% 0805
R113,R128,R49,R53,R56, R59,R63,R66	4720-471A-J	RMG 1/10W 470R 1% 0805
R170,R22,R23,R35,R36, R41,R42,R51,R62,R61,R52, R55,R58	4720-473A-J	RMG 1/10W 47K 1% 0805
R133,R97	4720-473J-J	RMG 1/10W 47K 5% 0805
R149,R224,R223,R211, R210,R192,R191,R172, R171,R150	4720-560A-J	RMG 1/10W 56R 1% 0805
R190,R195	4720-822J-J	RMG 1/10W 8.2K 5% 0805
R265,R256,R281,R243, R253,R254	4720-823A-J	RMG 1/10W 82K 1% 0805
DIODES		
D12,D15,D19,D23,D25-D34	4804-1480-3	DIODE LL4148 SM
D1-D4	4837-4B31-3	DZ 1/2W 4.17-4.43V
TRANSISTOR		
Q7,Q9,Q10	485C-8070-3	TR BC807-25 SOT23 SMD
Q1-Q6,Q8,Q11,	485C-848C-3	TR BC848C (1LP) HFE
HEATSINKS		
IC51/52	5400-3421-0	HEAT SINK
MISCELLANEOUS		
L1-L7	1808-0680-0	FERRITE BEAD INDUCTOR
IC51/52	2954-3008-0000	TAPPING 3X8MM B-TITE
FUSE2,FUSE1,FUSE3	4132-1011-0	FUSE HOLDER

PCB ASSY POWER SWITCH
PCB BOARD

ELECTRICAL PARTS LIST

Location	Part Number	Description
PCB ASSY POWER SWITCH		
PCB BOARD	**PCB-N0990C-PSW**	**PCB ASSY POWER SWITCH**
CAPACITORS		
C761	8910-0049-0	CAP400V 4700P
SWITCH		
	5200-0961-0-01	SW-PWR ALPS
MISCELLANEOUS		
C761	1660-0700-0	INSULATING BOOT (ID=14)
P1A	7012-6300-0	WIRE CON ASSY L=300MM
PCB ASSY VIDEO N0990C		
PCB BOARD		
3000	**PCB-N0990C-VID**	**PCB ASSY VIDEO N0990C**
CAPACITORS		
C33,C34,C39-C41,C52,C54, C55,C57,C66,C67,C83,C85, C106,C141,C243,C244	150D-225K-6-CF	CC 16V 2.2uF 10% 1206
C170,C174,C182,C195	150F-101K-J-BD	CC 50V 100P 10% 0805
C242	150F-102K-J-BD	CC 50V 1000pF 10% 0805 1
C38,C49,C53,C60,C63,C73 C161,C171,C186,C188, C189,C190,C196,C200, C203,C204,C210,	150F-103K-J-BD	CC 50V 0.01U 10% 0805
C4,C12,C13,C21,C23-C28 C31,C35,C43,C46,C50,C56, C61,C62,C69,C70,C75,C78, C79,C101-C104,C105,C109, C110,C112,C113,C118,C120, C121,C125-C129,C131,C132, C136,C142,C143,C146,C158, C160,C165,C167,C169,C172, C173,C175,C176,C177,C179,	150F-104K-J-BD	CC 50V 0.1uF 10% 0805

ELECTRICAL PARTS LIST

Location	Part Number	Description
C180,C184,C187,C191-C194, C197,C199,C201,C202,C205, C209,C212,C213,C216,C218, C221,C222,C232,C236,		
C139	150F-221K-J-BD	CC 50V 220pF 10% 0805 1.
C134	150F-223K-J-BD	CC 50V 0.022U 10% 0805
C214,C219	150F-270K-J-BD	CC 50V 27P 10% 0805
C149	154C-225K-3-CF	CT 10V 2.2UF 10% SM
C123,C166,C181,C198, C206,C207,C223	154D-106M-3-EF	CT 16V 10uF 20% SM
C225	154D-226M-3-FK	CT 16V 22UF 20% SM
C215,C217,C220,C224	154E-106M-3-FK	CT 25V 10uF 20% 3.2x6 SM
C1-C3,C5-C11,C14-C18, C32,C42,C44,C45,C47,C48, C51,C58,C59,C64,C68,C71, C72,C81,C82,C84,C87-C89, C90,C93,C94,C107,C119,C124, C130,C133,C135,C137,C147, C150,C151,C153,C157,C159, C178,C208,C211,C22,C241,	157C-107M-3-LJ	CE 10V 100uF 20% SM
C138,C148,C155,C162,C183	157C-477M-5-OU	CE 10V 470UF 20% RL 8X11
C164	15CG-220J-J-BD	CTC 0/30 22pF 5% 0805
C156,C168	15CG-330J-J-BD	CTC 0/30 33pF 5% 0805
C152,C154,C231	15CH-3R9D-J-BD	CTC 0/60 3.9pF 0.5pF
C185,C227	15CH-8R2D-J-BD	CTC 0/60 8.2pF 0.5pF
COILS		
TR1,TR2,TR3,TR4,TR5	1806-2430-0	DIGITAL COIL 980986540
WAFERS/JACKS		
X14,X16	2101-0831-0	WAFER 10PIN P2.54 DUAL
X11,X15	2101-1368-0	REDEPTACLE 8PIN DUAL
X3	2113-1121-0	2P RCA JACK Y/Y AU
X4,X6,X8	2113-1744-0	DIN JACK MIN 2P
X17	2113-1749-0	DB9 FEMALE D SUB RA

ELECTRICAL PARTS LIST

Location	Part Number	Description
X1,X2	2113-1752-0	RCA JACK 4P Y.Y.GOLD
X9	2113-1753-0	RCA JACK 4P G.B. GOLD
X12	2113-1754-0	RCA JACK 4P BL.BL. GOLD
X10	2113-1755-0	RCA JACK 4P R.O. GOLD
X7,X5	2113-1758-0	SVHS JACK
CRYSTAL		
CR4	2300-1240-0	CRYSTAL 12MHZ
CR3	2300-1980-0	CRYSTAL OSCILLATOR EPSON
CR2	2300-2000-0	CRYSTAL 17.734475 MHZ
CR1	2300-3020-0	X'TAL 14.318MHZ +-20PPM
IC		
IC1-IC3,IC7,IC8,IC10, IC12,IC21,IC22,IC25	3130-1730-0	IC HCF4066BM1
IC26	3130-4990-0	IC LM393D DUAL VOLTAGE
IC35	3130-6410-0	IC Z86E08 OTP
IC33	3130-6590-0	IC 74HC74 DUAL D-TYPE
VR1	3130-7010-0	IC LM431ACZ ADJ REG
IC24	3131-3520-0	IC STV5730A OSD
IC30	3131-7280-0	IC 74HC244 10x13 SOP20
IC4,-IC6,IC11,IC14-IC18, IC20,IC23,	3131-7330-0	IC OPA2652 DUAL OP-AMP
IC28	3131-7350-0	IC AM26LS32 SOP16 SMD
IC37	3131-7360-0	IC MAX4599EXT-T ANALOG
IC27	3131-7370-0	IC 74AC04 HEX INVERTERS
IC31	3131-7380-0	IC 74AC251 8-INPUT
IC29	3131-9200-0	IC XC9536PC44 PLCC-44
IC36	3131-9470-0	IC MAX232D SO16
IC9,IC13,IC19,	3131-9500-0	IC 74HC595AF 8BIT SHIFT
IC32	3131-9520-0	IC 74HC165AF SHIFT
RESISTOR		
R230,R214,R208,R205,R78, R73,R3,R294,R290,R289,	4720-000J-J	RMG 1/10W 0R 5% 0805

ELECTRICAL PARTS LIST

Location	Part Number	Description
R288,R252,R245,R234, R233,R231		
R273	4720-100J-J	RMG 1/10W 10R 5% 0805
R199,R201,R202	4720-101J-J	RMG 1/10W 100R 5% 0805
R21,R26-R28,R44,R46,R47, R53,R88,R110,R111,R115, R121,R122,R131,R132,R136, R141,R142,R145,R148,R151, R152,R156,R161,R170,R171, R179,R184,R191,R192,R200,	4720-102A-J	RMG 1/10W 1K 1% 0805
R18,R42,R98,R107,R108, R168,R207,R296	4720-103A-J	RMG 1/10W 10K 1% 0805
R64,R66,R67,R69,R72,R76, R79,R81,R93,R94,R97,R101, R102,R103,R105,R127,R129, R134,R138,R144,R149,R154, R157,R223-R229,R235,R236, R238,R239,R241,R242,R249, R284,	4720-103J-J	RMG 1/10W 10K 5% 0805
R43,R114,R135,R160,R183, R193	4720-104A-J	RMG 1/10W 100K 1% 0805
R19,R29,R48,R54,R165, R185,R195,R197,R203,R204, R212,R217,R219,R220,R222, R247,R253,	4720-104J-J	RMG 1/10W 100K 5% 0805
R172	4720-151J-J	RMG 1/10W 150R 5% 0805
R95,R109,R264,R268,R282, R291-R293,	4720-220J-J	RMG 1/10W 22R 5% 0805
R276	4720-221A-J	RGM 1/10W 220R 1% 0805
R281	4720-222A-J	RMG 1/10W 2.2K 1% 0805
R182	4720-223A-J	RMG 1/10W 22K 1% 0805
R206,R209	4720-242A-J	RMG 1/10W 2.4K 1% 0805
R221	4720-271A-J	RMG 1/10W 270R 1% 0805
R164	4720-273A-J	RMG 1/10W 27K 1% 0805
R240,R243	4720-331J-J	RMG 1/10W 330R 5% 0805

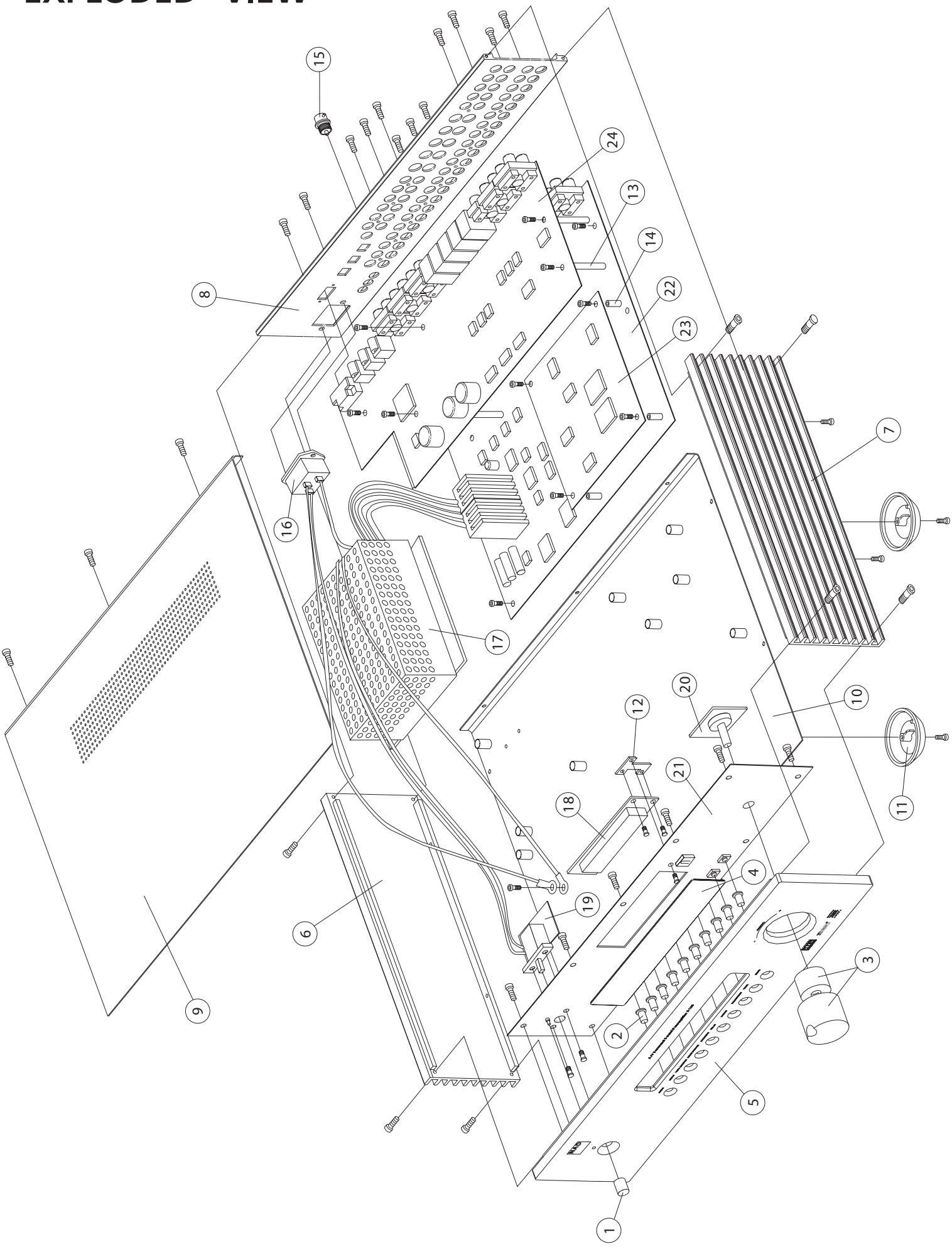
ELECTRICAL PARTS LIST

Location	Part Number	Description
R278	4720-332A-J	RMG 1/10W 3.3K 1% 0805
R211	4720-392A-J	RMG 1/10W 3.9K 1% 0805
R244	4720-432J-J	RMG 1/10W 4.3K 5% 0805
R213,R216,R232,R237	4720-471A-J	RMG 1/10W 470R 1% 0805
R86,R87	4720-472A-J	RMG 1/10W 4.7K 1% 0805
R210,R246	4720-472J-J	RMG 1/10W 4.7K 5% 0805
R11,R20,R23,R25,R50,R113	4720-473A-J	RMG 1/10W 47K 1% 0805
R120,R130,R140,R147, R150,R169, R2,R6,R8,R9,R12,R15-R17, R31,R32,R35,R38-R40,R49, R52,R55,R60,R62,R74,R80, R90,R99,R139,R146,R155, R162,R175,R176,R180, R181,R189,R190,R287, R295,R297,R298,R300	4720-474J-J	RMG 1/10W 470K 5% 0805
R274	4720-560J-J	RMG 1/10W 56R 5% 0805
R173,R177,R178	4720-561J-J	RMG 1/10W 560R 5% 0805
R1,R5,R7,R10,R13,R14,R22, R24,R30,R51,R57,R59,R61, R63,R68,R71,R75,R77,R83, R84,R91,R92,R100,R104, R106,R112,R116,R126,R143, R153,R163,R167,R186,R187, R194,R196,R218, R250,R251	4720-562A-J	RMG 1/10W 5.6K 1% 0805
L1-L21,L23-L25	4720-750A-J	RMG 1/10W 75R 1% 0805
D56	4720-750J-J	RMG 1/10W 75R 5% 0805
	4721-000J-6	RMG 1/8W OR 5% 1206
	4721-474J-6	RMG 1/8W 470K 5% 1206
DIODES		
D2,D4,D6,D8,D10,D12-D17,D19, D20,D23,D24,D27,D28,D31,D32, D34,D36,D37,D40,D41,D43,D44, D46,D47,D49,D51-D55,D57	4804-1480-3	DIODE LL4148 SM
D1,D3,D5,D7,D9,D11,D18,	4840-1990-3	DIODE BAS70-04 DOUBLE SC

ELECTRICAL PARTS LIST

Location	Part Number	Description
D21,D22,D25,D26,D29,D30,D33, D35,D39,D38,D42,D45,D48,D50,		
MISCELLANEOUS		
L26-L29	1808-0680-0	FERRITE BEAD INDUCTOR
CR1,CR2,CR4	3100-5121-0	INSULATION WASHER,
RCVR1,RCVR2	4811-F32R-3	LIGHT RX UNIT GPIF32R
TRNSM1	4811-F32T-3	LIGHT TX UNIT GP1F32T

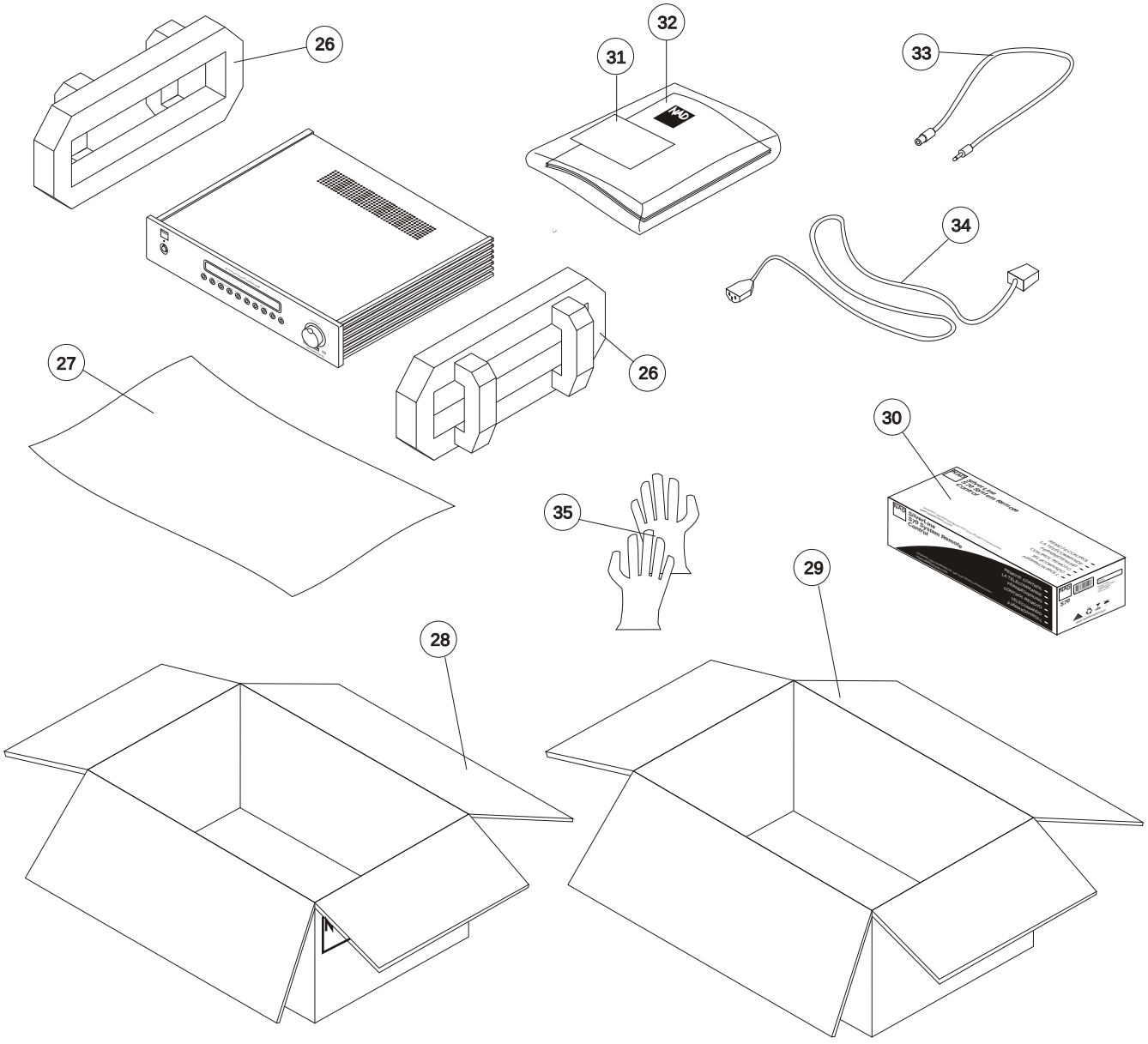
EXPLODED VIEW



EXPLODED VIEW

LOCATION	PART NUMBER	DESCRIPTION
1	**S100-2011-3**	Power button 10mm
2	**S100/S300-2121-1**	Input button
3	**S170-2032-1**	Volume Knob Assembly (two parts, inner and outer-shell)
4	**S170-2052-1**	Display Lens
5	**S170-2002-4**	Aluminum Fascia
6	**S170-2014-4**	Left Side Panel
7	**S170-2024-2**	Right Side Panel
8	**S170-2002-4**	Rear Panel
9	**S170-2004-1**	Top Cover
10	**S170-2034-4**	Base Cover
11	**S100-2013-2**	Foot
12	**GPE-PCB KIT**	Bracket (NSP) Part of GPE-PCB KIT
13	**S170-2234-2**	Stand-Off A (longer stand-off)
14	**S170-2334-3**	Stand-OFF B (shorter stand-off)
15	**GPE-PCB KIT**	BNC chassis-mount for Digital Input (NSP) Part of GPE-PCB KIT
16	**T40C**	IEC female plug (NSP) Part of the Power Supply
17	**T40C**	Power Supply
18	**GPE-PCB KIT**	Florescent Display Part of GPE-PCB KIT
19	**GPE-PCB KIT**	Power Switch and PCB with cables (NSP) Part of GPE-PCB KIT
20	**GPE-PCB KIT**	Volume Control Module (NSP) Part of GPE-PCB KIT
21	**GPE-PCB KIT**	Front Panel PCB with Power Switch & PCB with cables, and Volume Control Module (NSP) Part of GPE-PCB KIT
22	**GPE-PCB KIT**	Main PCB with Linear Power Supply, Audio Inputs & Outputs, and Trigger Out (NSP) Part of GPE-PCB KIT
23	**Gen6 A367**	Gen6 A367 DSP Assembly (NSP)
24	**GPE-PCB KIT**	Secondary PCB with Video Inputs & Outputs, S-Video Outputs, Component Inputs & Outputs, Digital and TOSLINK Inputs & Outputs. (NSP) Part of GPE-PSB KIT
*******	**GPE-PCB KIT**	Three Assemblies; Main, Secondary, Front Panel PCBs, **not including** Gen6 A367

PACKING DIAGRAM



ITEM	PART NUMBER	DESCRIPTION	QTY.
26	8700.0062	CUSHION	2
27	8700.0057	WRAPPING SHEET	1
28	862004	INNER CARTON BOX	1
29	862005	OUTER CARTON BOX	1
30	S70	REMOTE CONTROL W/ BATTERY	1 SET
31	8120.0189	WARRANTY CARD	1
32	S170-IM	OWNER'S MANUAL	1
33	4150.0022	12V TRIGGER CABLE	1
34*AH ⚠	4150.0025	POWER CORD 120V	1
34*C ⚠	4150.0024	POWER CORD 230V	1
35	8700.0056	GLOVES	1 PAIR

NOTES

SERVICE MANUAL

S170

A/V SURROUND SOUND PREAMPLIFIER

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633 Granite Court
Pickering, Ontario
Canada L1W 3K1

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